

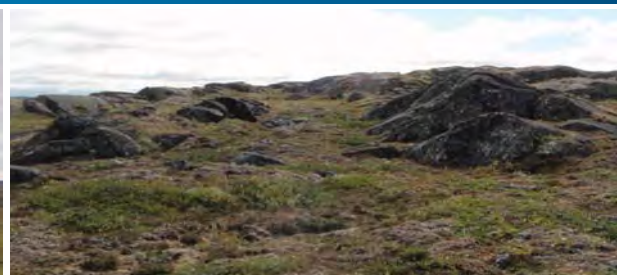
Appendix V4-7A

Hope Bay Belt Project:
2010 Terrain and Soils Baseline Report



Hope Bay Mining Limited

HOPE BAY BELT PROJECT 2010 Terrain and Soils Baseline Report



HOPE BAY BELT PROJECT

2010 TERRAIN AND SOILS BASELINE REPORT

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Prepared for:



Hope Bay Mining Limited

Prepared by:



Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

Executive Summary

The Hope Bay Belt Project is a gold project located in the West Kitikmeot region of Nunavut, approximately 125 km southwest of Cambridge Bay, Nunavut. The property consists of a greenstone belt running in a north/south direction, approximately 80 km long with three main gold deposit areas. The construction of the Doris North Project, located in the northern part of the belt, is currently underway. Hope Bay Mining Limited plans to develop additional deposits in the belt, and planning for this Phase 2 Project development has commenced.

The terrain and soils program was designed to fill in any information gaps in order to support the environmental assessment process for the Phase 2 Project. The main objective of the 2010 program was to characterize the terrain and soils that could be affected both directly and indirectly by the proposed Phase 2 Project.

Based on the results from the terrain and soils program, soils that have developed from morainal, organic, and glaciomarine materials dominate the study area. Approximately 32% of the surficial materials are morainal. Organic and glaciomarine materials represent 16% and 13% of the study area, respectively. Post-glacial down-slope washing, however, has resulted in mixing the surficial materials, particularly in the lower slope positions. In general, coarse morainal deposits occupy higher relief areas, whereas glaciomarine deposits, that are finer textured and non-stony, have accumulated in valley bottoms and on plains.

Soils in the study area were grouped into eleven soil mapping units based on surficial materials, soil order, surface expression, and drainage classes. Soil mapping units will be used to simplify and interpret soils information to determine the potential effects on the soils, as well as to assist in the development of future soil management plans and the reclamation and closure plan. Soil mapping units identified in the study area include three morainal mapping units, two glaciomarine/glaciolacustrine/lacustrine mapping units, two organic mapping units, one fluvial mapping unit, one bedrock mapping unit, one veneer mapping unit (<20 cm of soil), and one marine beach unit.

The dominant soils in the study area are classified as Cryosols and Brunisols. Cryosols generally have a permafrost layer within 30 to 60 cm of the surface and are imperfectly to poorly drained. They are typically associated with finer textured deposits and occur in lower landscape positions. Brunisols do not have a permafrost layer and are usually moderately well to rapidly drained. They are associated with coarser textured deposits and occur in upper landscape positions. Other less common soils are poorly drained Gleysols and well-drained Regosols.

Soil analytical results indicate that the soils in the study area are mildly alkaline to strongly acid. The soils generally have a low organic carbon content with the exception of soils with organic horizons. Metal concentrations in the study area are below CCME Soil Quality Guidelines for the protection of environmental health (parkland and industrial guidelines). The Soil Quality Guidelines for metals in soils related to human health (agricultural guidelines) were exceeded for chromium at three sample sites.

Acknowledgements

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HOPE BAY BELT PROJECT

2010 TERRAIN AND SOILS BASELINE REPORT

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Glossary and Abbreviations

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Ag	silver
Al	aluminum
Archean	The Archean Eon began about 4 billion years ago with the formation of the Earth's crust and extended to the start of the Proterozoic Eon 2.5 billion years ago.
As	arsenic
BC MELP	British Columbia Ministry of Environment, Lands and Parks
BC MOF	British Columbia Ministry of Forests
Ba	barium
Be	beryllium
Bi	bismuth
Boulder lag or boulder field	Boulders that are exposed as the finer fraction of morainal deposits were washed away by glacial meltwater and subsequent washing events (i.e., snow melt).
Brunisols	Moderately well-developed soils.
C	Celsius
CCME	Canadian Council of Ministers of the Environment
Ca	calcium
Cd	cadmium
Co	cobalt
Colluvial	Surficial materials transported and deposited by gravity.
Cr	chromium
Cryosols	Soils that have cryogenic (freeze and thaw) processes above the permafrost table; soils are characterized by distinct intrusions by adjacent horizons and may have discontinuous soil horizons.
Cu	copper
Diabase sills and dikes	vertical and tabular igneous intrusive bodies
Esker	A ridge of gravel and sand deposited during glacial melt by meltwater rivers flowing on the ice or beneath a glacier.
Eolian	surficial materials transported and deposited by wind
Fe	iron

Fluvial	surficial materials transported and deposited by moving water (streams and rivers)
Frost boils or mud boils	upwellings of mud that occurs through frost heave and cryoturbation in permafrost areas
Glaciofluvial	surficial materials transported by glacial rivers
Glaciomarine	surficial materials of glacial origin deposited in a marine environment in close proximity to glacier ice; marine shells may be present in the sediment
Gleysols	Gleysolic soils result from prolonged water saturation of the soil profile; water saturation leads to depletion of oxygen in the soil and soils have features associated with oxygen-depleted (mottles and gleyed colours) conditions.
Greenstone	various green metamorphic rocks formed from igneous rocks that have relatively low silica content and owe their colour to the presence of a green mineral such as chlorite, hornblende, or epidote
HBML	Hope Bay Mining Ltd.
Ha	hectares
Hg	mercury
Ice-wedge polygons	intersecting narrow cracks that contain ice-wedges comprise polygonal patterns on ground underlain by permafrost; typically found in level terrain, wet to moist basins
Isostatic rebound	rise of land masses that were depressed by the huge weight of ice sheets during the last glacial period
K	potassium
Km	kilometres
Li	lithium
M	metres
Mm	millimetres
Mg	magnesium
Mn	manganese
Mo	molybdenum
Morainal	Surficial materials transported by glaciers.
Na	sodium
Ni	nickel
P	phosphorus
Palsa; peat plateaus; raised bogs	flat-topped or rounded mounds and ridges of peat or peaty earth formed by differential frost-heaving; contain perennial ice lenses and a core of permafrost

Patterned ground	a collective term for surface features, such as, stone frost boils and stone polygons that are characteristic of ground that is subject to intensive frost (freeze-thaw) action
Pb	lead
Quaternary period	the most recent of the three periods of the Cenozoic Era in the geologic time scale; it spans 2.6 million years ago to the present; it includes two geologic epochs: the Pleistocene and the Holocene Epochs
Regosols	soils with little or no development; soil horizons are very weakly expressed, if present at all
SMU	Soil Mapping Units
Sb	antimony
Se	selenium
Solifluction	slow gravitational down-slope movement of saturated soils overlying permafrost
Sn	tin
Sr	strontium
Thermokarst or thaw lakes	thermal erosion by water depressions created by melting of ice-rich permafrost due to heat transfer from water bodies, either streams or lakes
Ti	titanium
Tl	thallium
UTM	Universal Transverse Mercator
V	vanadium
Washed till or moraine	sediments that have been modified by wave action along relict shorelines or by recent running meltwater
Wisconsinan glaciation	last of the Wisconsinan glaciation which began about 30,000 years ago, reached its greatest advance 21,000 years ago, and ended about 10,000 years ago
Zn	zinc

1. Introduction

1. Introduction

The Hope Bay Belt Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound (Figure 1-1). The nearest communities are Omingmaktok (75 km to the southwest of the property), Cambridge Bay, and Kingaok (Bathurst Inlet; 160 km to the southwest of the property).

The property consists of a greenstone belt running in a north/south direction, approximately 80 km long, with 3 main gold deposit areas. The Doris and Madrid deposits are located in the northern portion of the belt, and the Boston deposit is located in the southern end. The northern portion of the property consists of several watershed systems that drain into Roberts Bay, and a large river (Koignuk River) that drains into Hope Bay. Watersheds in the southern portion of the belt ultimately drain into the upper Koignuk, which drains into Hope Bay.

Hope Bay Mining Limited (HBML) is proceeding with the development of the Doris North Project. Required licences and permits are in place for the development of the Doris North Gold Mine, and construction of the project commenced in 2010.

HBML plans to develop additional deposits in the belt, and planning for this Phase 2 Project development has commenced. Baseline studies to support the permitting of the Phase 2 Project were carried out in 2009, and were continued in 2010. The environmental baseline program conducted in 2010 was intended to fill in information gaps in order to support the permitting process for the Phase 2 Project, which is anticipated to start in 2011. The site layout options considered for the 2010 Phase 2 environmental baseline program are shown in Figure 1-2.

Results from the 2010 Phase 2 Project environmental baseline program are being reported in a series of reports, as follows:

- 2010 Hydrology Baseline Report
- 2010 Freshwater Baseline Report
- 2010 Freshwater Fish and Fish Habitat Baseline Report
- 2010 Marine Baseline Report
- 2010 Marine Fish and Fish Habitat Baseline Report
- 2010 Terrain and Soils Baseline Report
- 2010 Country Foods Baseline Report
- 2010 Ecosystems and Vegetation Baseline Report
- 2010 Marine Wildlife Baseline Report

In addition, numerous reports are being produced as part of the Doris North Project compliance requirements, and many of these reports cover the geographical areas of the proposed Phase 2 Project. Examples of Doris North Project compliance reports generated in 2010 that are relevant to the proposed Phase 2 Project include:

- 2010 Meteorology Monitoring Report, Doris North Project
- 2010 Hydrology Compliance Report, Doris North Project



Figure 1-1

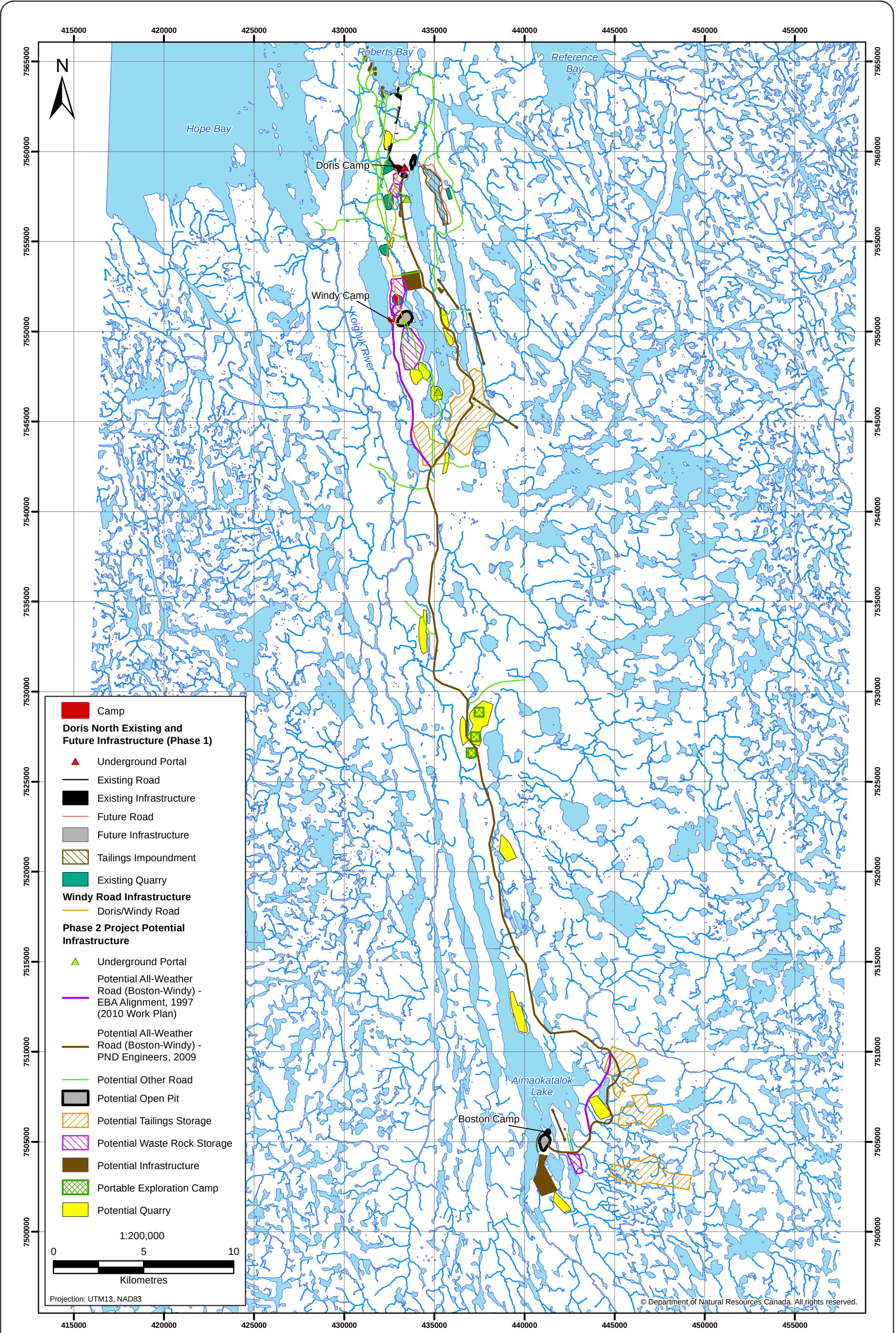


Figure 1-2

Figure 1-2



Site Layout Options Considered for
Phase 2 Baseline Program, 2010



- 2010 Wildlife Monitoring and Mitigation Report, Doris North Project
- 2010 Wildlife DNA Study, Doris North Project
- 2010 Air Quality Compliance Reports, Doris North Project

Archaeology work was also conducted in 2010 and is being reported separately.

This report presents the results from the terrain and soils portion of the 2010 Phase 2 environmental baseline program. The objectives of the 2010 terrain and soils baseline work were as follows:

- Map and characterize terrain, surficial materials, and soils of the study area;
- Group soils into soil mapping units for interpretative and management purposes; and
- Identify features that are locally or regionally sensitive to disturbance.

To meet these objectives, the 2010 Terrain and Soils Program was designed to provide terrain mapping based on a review of aerial photography and anaglyph data and then supplement and verify this with a site-specific field investigation of the study area.

2. Methods

2. Methods

The following sections outline Rescan's methodologies for conducting a background review, the Baseline Study Area, terrain mapping, and a detailed soils investigation of the study area.

2.1 REVIEW OF EXISTING INFORMATION

To prepare for terrain and soils work, Rescan reviewed the existing climate, geology, surficial geology, and topography for the study area. This information is critical in understanding the formation and characterization of the terrain and soils in the study area. Regional (historical) climatic data from nearby Environment Canada and Rescan meteorological stations were reviewed along with meteorological data collected on-site for the Project.

2.2 STUDY AREA

The terrain and soils study area for the Hope Bay Belt was first defined in 1996, during preliminary project planning. The 1996 study area included all infrastructure and roads from the Doris North area to the Boston Camp area in the south. In 2010, the study area was expanded to incorporate potential Phase 2 Project infrastructure. For the purposes of this report, both the 1996 and 2010 study areas were combined to create a larger study area that is approximately 56,277 hectares (ha) (Figures 2.2-1a to 2.2-1c) and covers potential Phase 2 Project infrastructure in addition to existing Doris North infrastructure from Boston Camp to Roberts Bay.

2.3 TERRAIN AND SOILS MAPPING

Terrain and soils information was collected in 1996, during preliminary project planning, and in 2010. Descriptions for the methodologies used for terrain mapping and detailed soils inspections are provided below.

2.3.1 Terrain Mapping

Terrain maps were prepared for the study area using aerial photography collected in 1996 and anaglyph data collected in 2010 which were analyzed using Purview. Terrain polygons were delineated at a scale of 1:20,000. In the absence of a terrain classification system for Nunavut or the Northwest Territories, the terrain of each polygon was described according to the Terrain Classification System for British Columbia (Howes and Kenk 1997). This has been successfully used in the North. The descriptions include information on:

- surficial materials
- surface expressions
- geomorphic processes; and
- drainage

The terrain mapping prepared in 1996 was revised in 2010 to reflect the findings of new terrain and soil information findings from 2010. Terrain mapping for the study area is appended (Appendix 1, Figures A1-a to A1-e). Map information includes terrain polygon boundaries, terrain labels, 10 and 50 metres (m) contours, and existing and proposed infrastructure including roads.

2.3.2 Detailed Soil Inspection

Field checking of the terrain polygons was carried out in 1996 and 2010 during which detailed soil inspections and necessary corrections for the terrain mapping were made.

A total of 287 soil inspection sites (124 in 1996 and 163 in 2010) were described within the study area (Figure 2.3-1). Soil pits were excavated by hand shovel to a depth of approximately 70 cm, or to permafrost. In the absence of a soil description system for Nunavut or the Northwest Territories, the soils were described according to the Field Manual for Describing Terrestrial Ecosystems (BC MELP and BC MoF 1998). This system has been successfully used in the North. The following information was collected:

- location (UTM coordinates)
- elevation
- surficial material
- surface expression
- slope (gradient, aspect, and elevation)
- coarse fragment content
- soil texture
- soil drainage
- soil colour (Munsell system)
- rooting depth
- soil horizon designation and depth
- permafrost depth
- soil classification

UTM coordinates were collected using handheld GPS units with accuracy ranges of less than 15 m. The soils were classified according to the Canadian System of Soil Classification (Soil Classification Working Group 1998). The detailed site information and soil descriptions for the soil inspection sites are appended (Appendix 2).

2.3.3 Soil Mapping

The terrain and soils information collected in 1996 and 2010 was compiled and soils in the study area were grouped into 11 soil mapping units based on their attributes and dominant surficial material. The terrain mapping polygon boundaries were used to form the boundaries of the soil mapping units. Soil polygons were delineated at a scale of 1:20,000.

Each soil mapping unit in the study area represents a group of soils that belong to the same soil classification order and are comprised of the same surficial materials that occur in similar conditions (i.e. drainage and landscape position). The soil mapping unit concept is similar to a soil association. A soil association is a group of soils that occur together on the same surficial material to form a land pattern (Soil Classification Working Group 1998). Soil mapping units are important tools for interpreting soils information as well as developing future soil management plans.

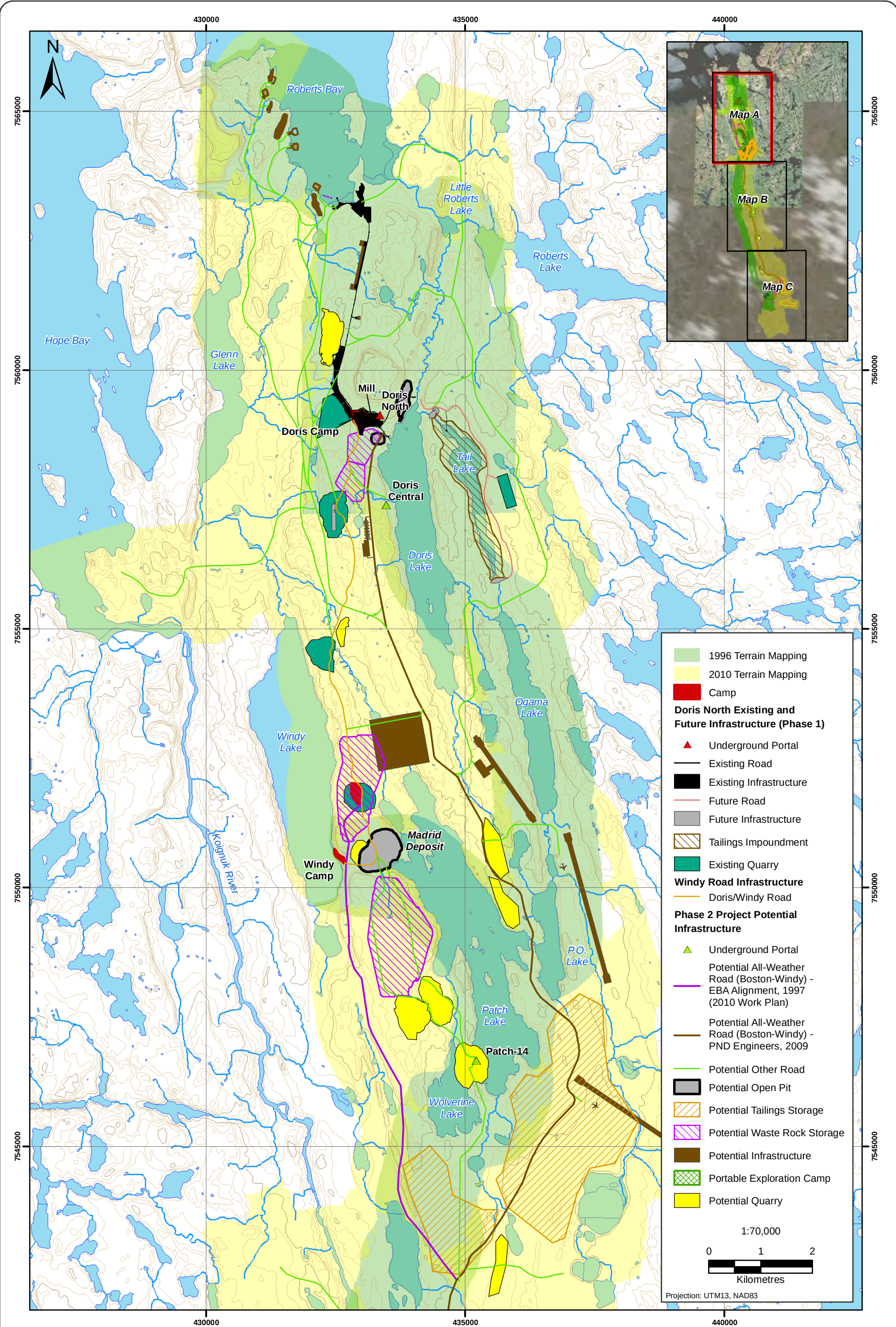


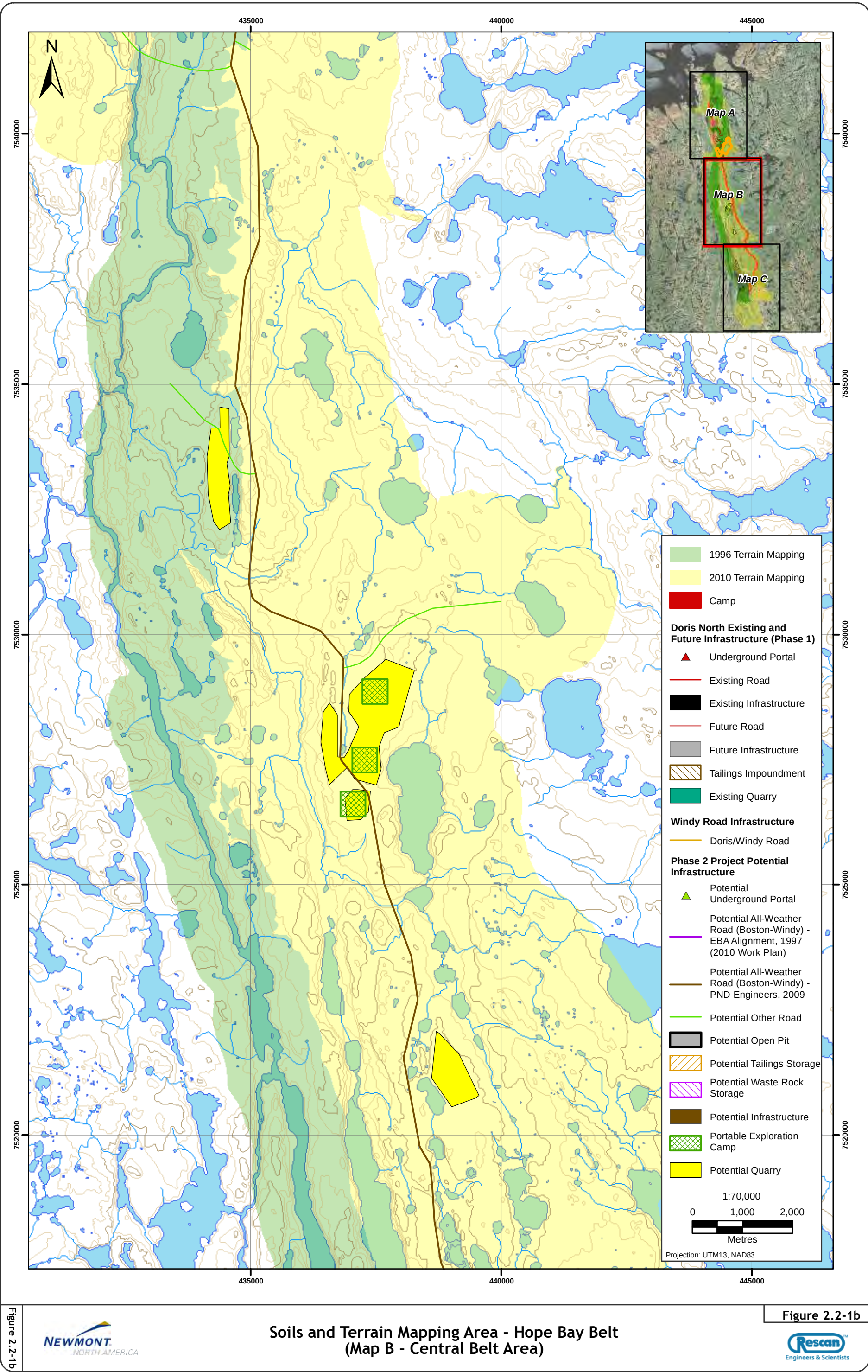
Figure 2.2-1a



Soils and Terrain Mapping Area - Hope Bay Belt
(Map A - North End of the Belt Area)

Figure 2.2-1a





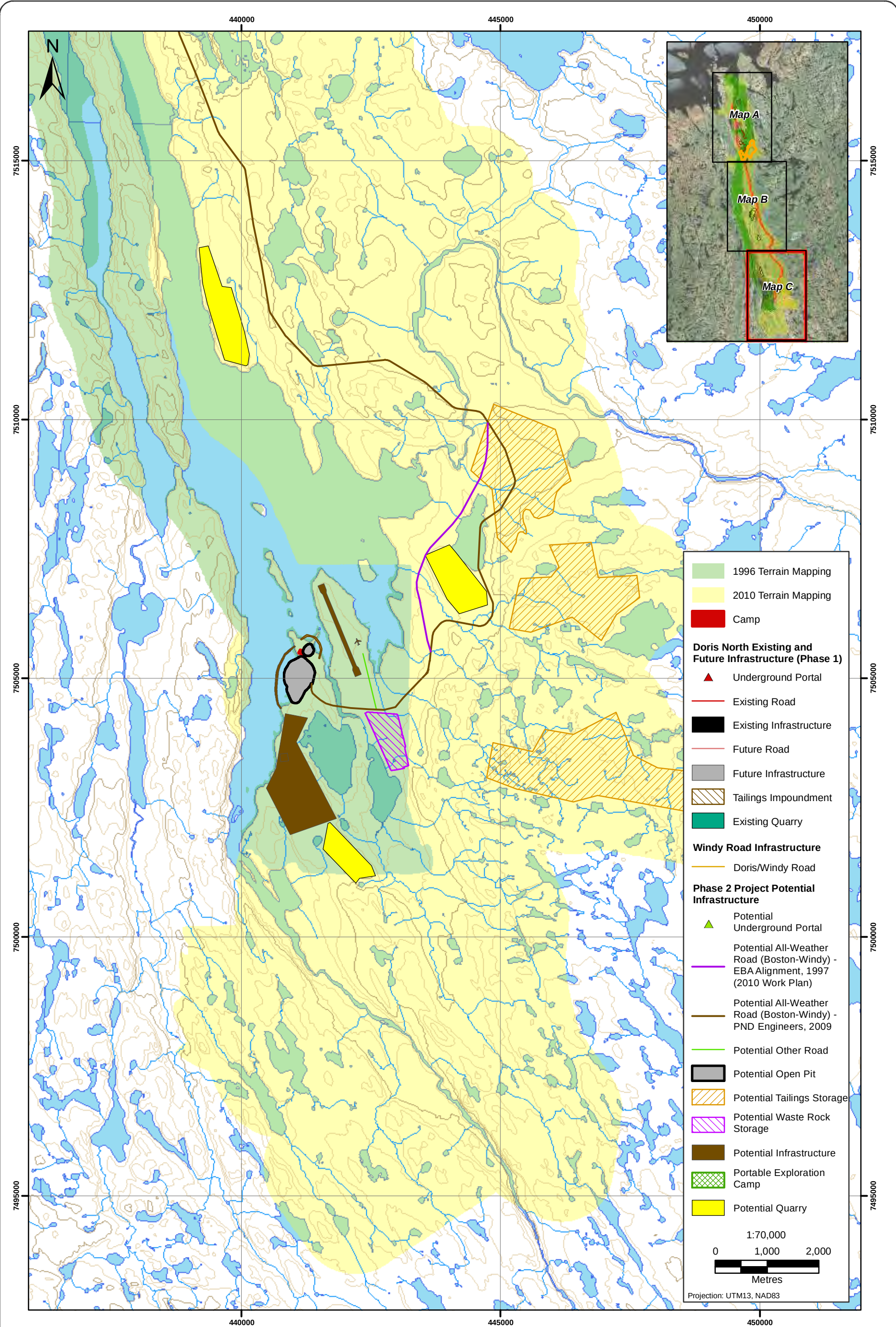


Figure 2.2-1c



Soils and Terrain Mapping Area - Hope Bay Belt
(Map C - South End of the Belt Area)

Figure 2.2-1c



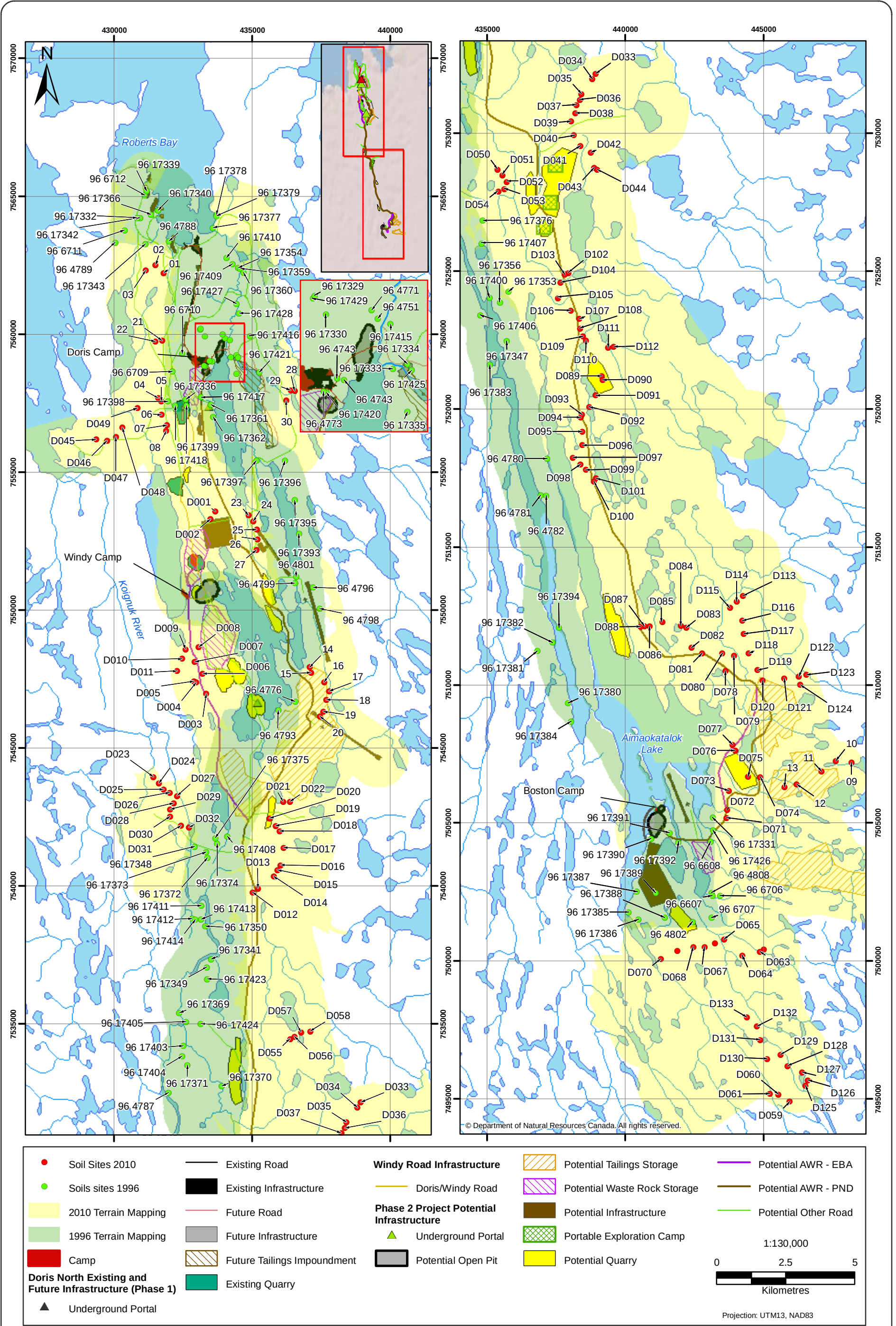


Figure 2.3-1

Figure 2.3-1

Maps illustrating the abundance and location of the eleven soil mapping units are appended (Appendix 3, Figure A3-a to A3-e). Map information includes soil mapping unit polygon boundaries, soil labels, the locations of the soil inspection sites, and existing and proposed infrastructure including roads.

2.3.4 Sampling and Laboratory Analysis

Soil samples were collected from representative locations throughout the study area. A total of 70 samples were collected in 2010. The samples were collected from two depths from the surface of the mineral soil (0 to 10 cm depth and 10 to 20 cm depth). Samples were placed in clean plastic bags, labelled, and then submitted to ALS Environmental (ALS), Vancouver, BC, for laboratory analysis.

All samples were analysed for pH, total organic carbon, and total metals (Table 2.3-1). The detailed analytical procedures used by ALS Laboratories and the results of the analyses are appended (Appendix 4).

Table 2.3-1. Baseline Soil Quality Parameters and Detection Limits

Parameter	Units	Detection Limits
pH	pH units	0.10
Organic/Inorganic Carbon		
Total Organic Carbon (TOC)	%	0.10
Metals		
Aluminum (Al)	mg/kg	50
Antimony (Sb)	mg/kg	10
Arsenic (As)	mg/kg	5.0
Barium (Ba)	mg/kg	1.0
Beryllium (Be)	mg/kg	0.50
Bismuth (Bi)	mg/kg	20
Cadmium (Cd)	mg/kg	0.50
Calcium (Ca)	mg/kg	50
Chromium (Cr)	mg/kg	2.0
Cobalt (Co)	mg/kg	2.0
Copper (Cu)	mg/kg	1.0
Iron (Fe)	mg/kg	50
Lead (Pb)	mg/kg	30
Lithium (Li)	mg/kg	2.0
Magnesium (Mg)	mg/kg	50
Manganese (Mn)	mg/kg	1.0
Mercury (Hg)	mg/kg	0.0050
Molybdenum (Mo)	mg/kg	4.0
Nickel (Ni)	mg/kg	5.0
Phosphorus (P)	mg/kg	50
Potassium (K)	mg/kg	200
Selenium (Se)	mg/kg	0.50

(continued)

Table 2.3-1. Baseline Soil Quality Parameters and Detection Limits (completed)

Parameter	Units	Detection Limits
Metals (continued)		
Silver (Ag)	mg/kg	2.0
Sodium (Na)	mg/kg	200
Strontium (Sr)	mg/kg	0.50
Thallium (Tl)	mg/kg	1.0
Tin (Sn)	mg/kg	5.0
Titanium (Ti)	mg/kg	1.0
Vanadium (V)	mg/kg	0.050
Zinc (Zn)	mg/kg	2.0

3. Background

3. Background

The following section provides a brief description of the climate, bedrock geology, surficial materials, and topography in the study area.

3.1 CLIMATE

The annual average temperature between 2002 and 2009 collected from meteorological stations in the Boston Camp area and Doris North area were -11.7°C and -11.1°C , respectively (Rescan 2009). The 1971 to 2000 climate normal annual precipitation recorded at Environment Canada's meteorological stations at the Cambridge Bay regional station was 139 mm. Annual precipitation is comprised of 70 mm of rainfall and 69 mm of snow water equivalent.

3.2 BEDROCK GEOLOGY

The Hope Bay Belt occurs in the Slave Structural Province, a geological sub-province of the Canadian Shield. The region is underlain by the late Archean Hope Bay greenstone belt. This geological formation ranges from seven to 20 km in width and over 80 km in length. It is oriented in a north-south direction. The late Archean Hope Bay greenstone belt lies entirely within the faulted Bathurst Block forming the northeast portion of the Slave Structural Province. The belt is mainly comprised of mafic metavolcanic (mainly meta-basalts) and meta-sedimentary rocks that are bound by Archean granite intrusive and gneisses.

3.3 SURFICIAL MATERIALS

The study area has been subjected to multiple glaciations during the Quaternary period. During each glaciation, the area was overridden by the north-western section of the Laurentide Ice Sheet. Evidence of only the most recent glaciation (Late Wisconsinan) is preserved in the present day landscape. Striations, orientation of eskers, grooves, and drumlins indicate that the predominant glacial ice movement was north-northwest.

The study area became ice-free about 8,800 years ago as the ice sheet melted back toward the southeast leaving a blanket of basal till (morainal deposits) (Dyke and Prest 1986). During the period of glacier recession, the region became entirely submerged under water and marine sediments were deposited over most of the landscape. Since the end of the Wisconsinan Glaciation, the land emerged from the sea through isostatic rebound. As it emerged, surface sediments were exposed to washing regimes that varied depending on local differences in topography and exposure.

Areas exposed to high energy washing, generally high relief areas, have had marine deposits either completely washed away exposing the underlying moraine and or bedrock, or have had larger, coarser marine sediments (predominantly sands and gravels) deposited as isolated beaches (Rescan 1997). Washing has also resulted in the accumulation of finer textured marine (glaciomarine) deposits in valley bottoms. At times, these glaciomarine deposits are complexed or are mixed with the finer fractions of morainal deposits that have also been washed down-slope.

3.4 TOPOGRAPHY

In general, the study area has low to moderate surface relief with less than 50 m of differential elevation between low and high points. The topography is best described as gently rolling with long and narrow drainage basins oriented in a north-south direction with similarly oriented rock outcroppings.

The study area has been divided into three separate areas based on changes in terrain:

- North end of the belt;
- South end of the belt; and
- Central area.

The terrain in these areas is described below.

3.4.1 North End of the Belt

The north end of the belt comprises the area from Roberts Bay to Wolverine Lake. The topography of this area is characterized by low and moderate relief with some high relief features (Doris mesa which is a diabase dike, Plate 3.4-1). This area is typical of coastal lowlands in the Arctic, with water features (lakes and ponds) occurring in low relief areas and glacial landforms (ridges and eskers) and rock outcroppings (diabase sills and dikes) occurring on moderate relief areas. The elevation ranges from sea level at Roberts Bay to 158 m in elevation at the summit of the Doris mesa.



Plate 3.4-1. View of terrain in the north end of the belt (Site 6 looking west).

3.4.2 South End of the Belt

The south end of the belt comprises the area that is adjacent to Aimaokatalok Lake and is associated with the Boston Camp area. This area has low to moderate surface relief. It is characterized by lowlands occurring as plains and terraces and is interspersed with numerous thaw lakes (Plate 3.4-2).

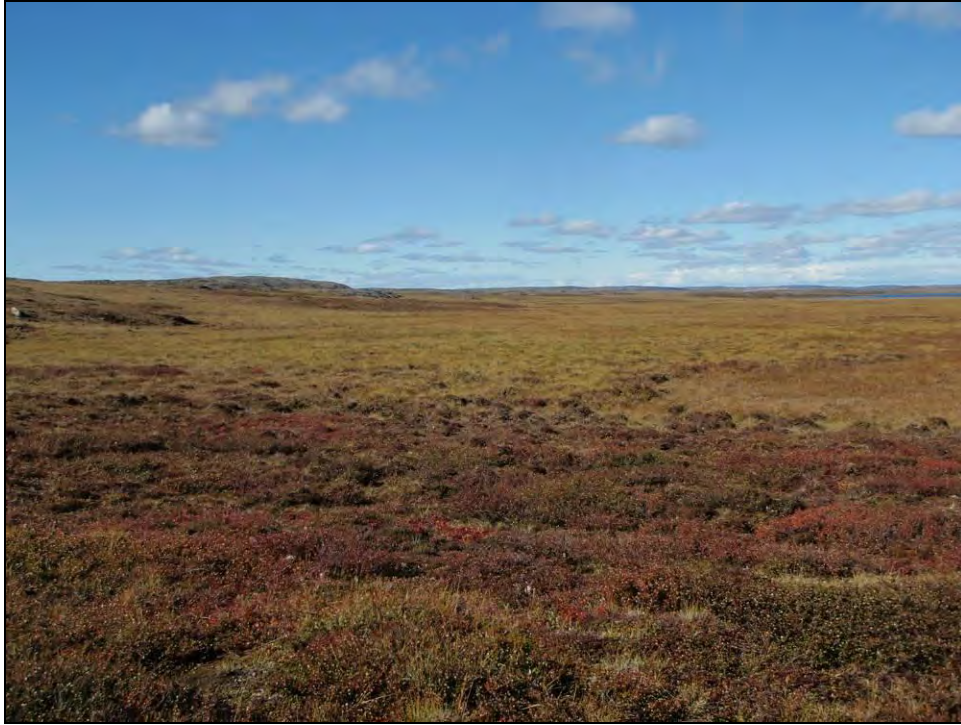


Plate 3.4-2. View of terrain in south end of the belt (Site D066).

3.4.3 Central Area

The relief in the central area (between the north and south ends of the belt) is generally subtle with large, level terraces. There are numerous, round thaw lakes separated by gentle topography.

4. Soils and Terrain Findings

4. Soils and Terrain Findings

Based on a review of the terrain maps and the detailed soil investigations from 1996 and 2010, soils in the Hope Bay Belt area are developed on a variety of deposits including morainal, glaciomarine, glaciolacustrine, lacustrine, fluvial, and organic deposits. These are described in detail in the following section.

4.1 SURFICIAL MATERIAL

Morainal, organic, and glaciomarine surficial materials dominate the study area (Table 4.1-1), as indicated on the appended terrain maps (Appendix 1, Figures A1-a to A1-e).

Table 4.1-1. Surficial Materials in Study Area

Surficial Material	Area (ha)	Percentage (%)
Morainal	18,206	32
Organic	9,172	16
Glaciomarine	7,066	13
Glaciolacustrine	3,777	7
Bedrock and weathered bedrock	5,398	10
Lacustrine	447	1
Colluvial	799	1
Fluvial	787	1
Eolian	479	1
Glaciofluvial	182	<1
Marine	155	<1
Anthropogenic	8	<1
Water	9,801	17
Total	56,277	100

Morainal deposits are widespread throughout the study area and occupy 32% or 18,206 ha. They generally occur at higher elevations, flanking bedrock outcroppings. Morainal deposits are washed (Plate 4.1-1) resulting in boulder lag in upper slope positions and the finer fractions of washed moraine in adjacent, down-slope areas. In the south belt area, boulder lag is prevalent (Plates 4.1-2 and 4.1-3). Permafrost was encountered within the upper one metre of the soil profile in some of the lower lying areas.

Organic deposits are associated with poorly drained basins. They generally occur as thin veneers primarily over glaciomarine deposits. They occupy approximately 16% of the study area or 9,172 ha. Permafrost in organic deposits was generally encountered within the upper metre.

Glaciomarine deposits occur throughout the study area, but are widespread in the central to south end of the belt. They occupy approximately 13% of the study area or 7,066 ha. Most of the glaciomarine deposits occur in valley bottoms and on plains in complexes with the finer fractions of washed moraine. Glaciomarine materials are usually affected by permafrost. Ice-wedge polygons are common. Some areas are also subject to seepage.



Plate 4.1-1. Washing on moderately sloping moraine deposits (Site 30).



Plate 4.1-2. Boulder lag on morainal deposits (Site D073).



Plate 4.1-3. Boulder fields occurring in the study area.

Glaciolacustrine deposits occupy approximately 7% of the study area. Glaciolacustrine deposits are deposits from relict lakes that formed in depressional areas when the sea retreated and the study area re-emerged. These relict lakes have since dried up. Glaciolacustrine deposits occupy many of the same landscapes as glaciomarine deposits. They are distinguishable from glaciomarine deposits by the lack of shells in the soil matrix. In general, however, the boundaries between glaciomarine and glaciolacustrine deposits are not easily identified. Glaciolacustrine deposits are typically underlain by permafrost occurring within the upper one metre of the soil profile.

Lacustrine deposits occur adjacent to the vicinity of present day lakes. They occupy approximately 1% of the study area. They are underlain by permafrost and are subject to seepage.

Other surficial materials, such as fluvial, glaciofluvial, colluvial, eolian, and relict beach deposits also occur in the study area. Non-soils, such as bedrock and weathered bedrock occupy approximately 10% of the study area. Water occupies approximately 17% of the study area.

4.2 SOILS MAPPING UNITS

The detailed field investigation indicates that several types of soils occur in the study area. The general characteristics and stage of development of these soils is dependent on the surficial materials, topographic features of the terrain (e.g., slope), landscape position, and site drainage.

Based on these factors, the study area has been divided into 11 soil mapping units (SMU). There are three morainal mapping units, two glaciomarine/glaciolacustrine/lacustrine mapping units, two organic mapping units, one fluvial mapping unit, one marine beach unit, one bedrock mapping unit, and one thin veneer mapping unit (<20 cm of soil). The location and abundance of these mapping units is illustrated in the appended soils maps (Appendix 3, Figures A3-a to A3-e). The area extent of the mapping units, as they occur in the study area, is presented in Table 4.2-1.

Table 4.2-1. Aerial Extent of Soil Mapping Units in the Study Area

Dominant Surficial Material/s	Soil Mapping Unit	Area (ha)	Percentage (%)
Morainal	MR	3,970	7
	M1	7,508	13
	M2	5,665	10
Glaciomarine/ Glaciolacustrine/ Lacustrine	W1	1,455	3
	W2	9,996	18
Organic	O1	7,526	13
	O2	2,124	4
Glaciofluvial/Fluvial	F	816	2
Beach	Z	50	<1
Bedrock	R	4,937	9
Very thin veneers (<20 cm)	V	3,338	6
Water	Water	8,882	16
Anthropogenic	A	10	<1
Total		56,277	100

The following is a description of each of the soil mapping units which are presented according to surficial material type. Each mapping unit includes a description of the soil classification, drainage, slope, and other differentiating characteristics. Some mapping units have small, scattered waterbodies within them.

4.2.1 Morainal Soil Mapping Units

There are three morainal soil mapping units (SMU) in the study area (SMUs M1, M2, and MR). They represent approximately 30% of the study area (Table 4.2-1). Soils developed on these materials are mostly found in the higher relief areas and are closely associated with exposed and/or weathered bedrock. They occur as veneers (<1 m thick), blankets (> 1 m thick), or variable thicknesses.

4.2.1.1 Soil Mapping Unit MR

Mapping Unit MR is comprised of well drained to very rapidly drained Brunisols (moderately well developed soils) (Plate 4.2-1) and Regosols (soils with little development). They occur as complexes of morainal blankets and bedrock or morainal veneers over bedrock in areas of relatively high relief on undulating or moderately sloping terrain (Plate 4.2-2). Boulder lag can be found scattered across these landscapes. Soils are moderately coarse to coarse textured (sandy loam to loamy sand) with coarse fragments ranging from 15 to 40% (gravel, cobbles, and boulders).

SMU MR occupies approximately 7% of the study area.



Plate 4.2-1. Dystric Brunisol in SMU M1 (Site 2).



Plate 4.2-2. Undulating and rocky terrain in SMU MR (Site 2).

4.2.1.2 Soil Mapping Unit M1

Mapping Unit M1 is comprised of moderately well to rapidly drained Brunisols (Plate 4.2-3), with some Cryosols (soils affected by permafrost and freezing and thawing). Permafrost, if present in the soil profile, was encountered at 60 to 80 cm below the surface. Soil Mapping Unit M1 occurs in areas down-slope from SMU MR and generally does not have any exposed bedrock. These soils occur on undulating to gently sloping terrain (Plate 4.2-4). Boulder lag can sometimes be found scattered across these landscapes. Soils are moderately coarse to coarse textured (sandy loam to loamy sand) with coarse fragments ranging from 15 to 25% (mostly gravel and cobbles, with some boulders).

SMU M1 occupies approximately 13% of the study area.



Plate 4.2-3. Eluviated Dystric Brunisol in SMU M1 (Site D022).

4.2.1.3 Soil Mapping Unit M2

Mapping Unit M2 is comprised of imperfectly to poorly drained soils that are primarily classified as Cryosols, with some Gleysols (poorly drained soils) (Plate 4.2-5). Permafrost was encountered at 40 to 80 cm below the surface. These mapping units typically occur in lower landscape positions compared to MR and M1 mapping units, usually on gently sloping to level terrain (Plate 4.2-6). They are comprised of the finer fractions of washed morainal deposits and usually occur in close proximity to glaciolacustrine and/or glaciomarine deposits. Soil textures are medium to moderately coarse (silt loam to sandy loam) with coarse fragments ranging from 5 to 15% (mostly gravel with occasional cobbles).

SMU M2 occupies approximately 10% of the study area.



Plate 4.2-4. Gently sloping terrain in SMU M1 (Site D022).



Plate 4.2-5. Gleysolic Static Cryosol in SMU M2 (Site 12).



Plate 4.2-6. Flat terrain in SMU M2 (Site 12).

4.2.2 Glaciomarine/Glaciolacustrine/Lacustrine Soil Mapping Units

There are two soil mapping units in the study area that are comprised of glaciomarine, glaciolacustrine, and lacustrine deposits (SMUs W1 and W2). They represent approximately 21% of the study area (Table 4.2-1). These surficial materials are grouped together in the same mapping units because they represent surficial materials that were deposited in a similar fashion (settled out from suspension in aquatic environments, either lake or marine) resulting in similar physical soil characteristics. They occupy many of the same landscape positions and, at times, are difficult to distinguish from one another due to the redistribution of sediments as a result of post-glacial washing. These mapping units are comprised of well-sorted, moderately fine to fine textured silts and clays, with very few (<2%) to no coarse fragments.

4.2.2.1 Soil Mapping Unit W1

Mapping Unit W1 is comprised of moderately well drained Cryosols (Plate 4.2-7). They generally had a permafrost layer within 30 cm to 70 cm of the surface and are subject to frost action resulting in frost boils. These mapping units are closely related to SMU M2, generally occurring in close proximity to the finer fractions of washed morainal deposits in areas of relatively low relief (Plate 4.2-8). Soils are moderately fine textured (silty clay loam) and are typically stone free with occasional gravels in some areas.

SMU W1 occupies approximately 3% of the study area.



Plate 4.2-7. Regosolic Turbic Cryosol in SMU W1 (Site D021).



Plate 4.2-8. Flat terrain in lacustrine sediments of SMU W1 (Site D021).

4.2.2.2 Soil Mapping Unit W2

Mapping Unit W2 is comprised of imperfectly to poorly drained Cryosols (Plate 4.2-9), but some very poorly drained Gleysols do occur. Permafrost, if present in the soil profile, was encountered at 20 cm to 60 cm below the surface. Soils with permafrost in the upper one metre, are subject to frost action resulting in frost boils. These soils are moderately fine to fine textured (silty clay loam to silty clay) and occur as blankets on level to depressional terrain (Plate 4.2-10).

SMU W2 occupies approximately 18% of the study area.



Plate 4.2-9. Gleysolic Turbic Cryosol in SMU W2 (Site D113).

4.2.3 Organic Soils

There are two organic soil mapping units in the study area (SMUs O1 and O2). They represent approximately 17% of the study area (Table 4.2-1). These mapping units are comprised of thin veneers of organic deposits over glaciomarine, glaciolacustrine, and morainal deposits. They are typically not deep enough to be classified as Organic soils (i.e., organic deposits must be >40 cm), however, the presence of organic materials denotes an important change in drainage and landscape position compared to other mapping units. These mapping units typically occupy the lowest landscape positions in the study area.

4.2.3.1 Soil Mapping Unit O1

Mapping Unit O1 is comprised of imperfectly to very poorly drained Organic Cryosols (Plate 4.2-11). These soils occur in depressional areas and are usually underlain by fine textured materials (glaciomarine or glaciolacustrine) that are affected by permafrost, resulting in patterned ground (Plate 4.2-12) and ice-wedge polygons.

SMU O1 occupies approximately 13% of the study area.



Plate 4.2-10. Flat terrain in glaciomarine sediments of SMU W2 (Site D113).



Plate 4.2-11. Mesic Organic Cryosol in SMU O1 (Site D054).

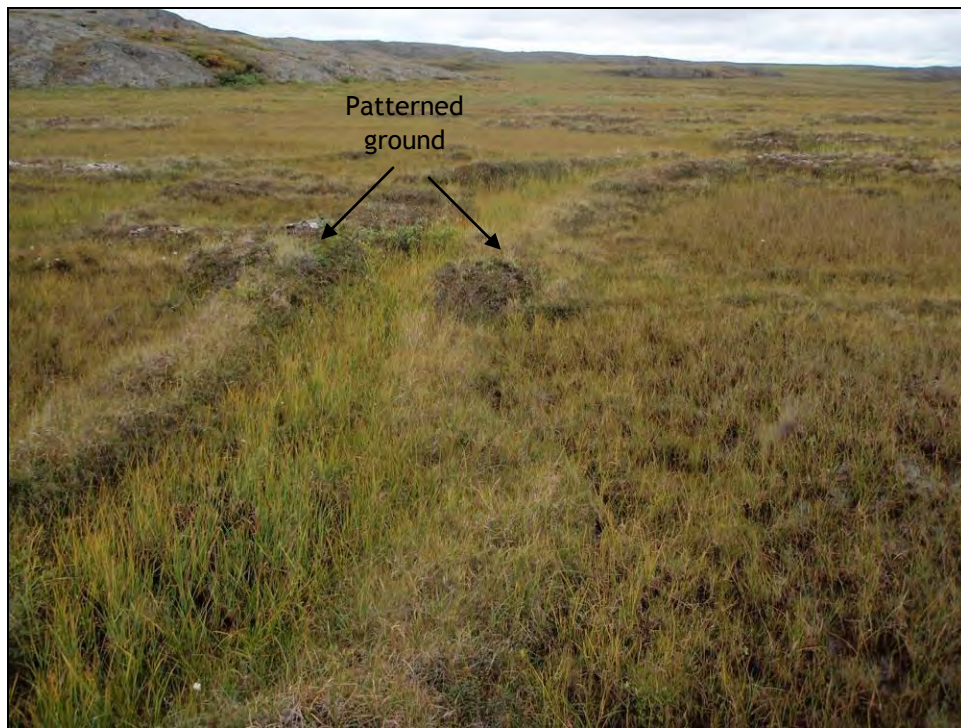


Plate 4.2-12. Very poorly drained organic veneers in SMU O1 (Site D054).

4.2.3.2 Soil Mapping Unit O2

Mapping Unit O2 is comprised of imperfect to moderately well drained Organic Cryosols (Plate 4.2-13). These soils occur as organic veneers over moraine and or bedrock. They generally occur as pockets of organic deposits within morainal complexes in areas with no drainage outlets or as raised bogs or palsas (Plate 4.2-14).

SMU O2 occupies approximately 4% of the study area.

4.2.4 Fluvial Soil Mapping Unit (SMU F)

Mapping Unit F is comprised of poor to moderately well drained Cryosols and Brunisols (Plate 4.2-15). Soils that are moderately well drained gravelly sands are typically classified as Brunisols and soils that are poor to imperfectly drained silty loams are classified as Cryosols. In the Cryosolic soils, the permafrost was encountered at 40 to 60 cm below the surface. Mapping Unit F soils generally occur in relict river channels (from glacial meltwater) or in active fluvial floodplains (Plate 4.2-16).

SMU F occupies approximately 2% of the study area.

4.2.5 Beach Soil Mapping Unit (Soil Mapping Unit Z)

Mapping Unit Z is comprised of well-drained Regosols. These soils occur as active beach deposits along the Robert's Bay shoreline. They are generally comprised of sandy gravelly soils. SMU Z occupies less than 1% of the study area.



Plate 4.2-13. Humic Organic Cryosols (Site D109).

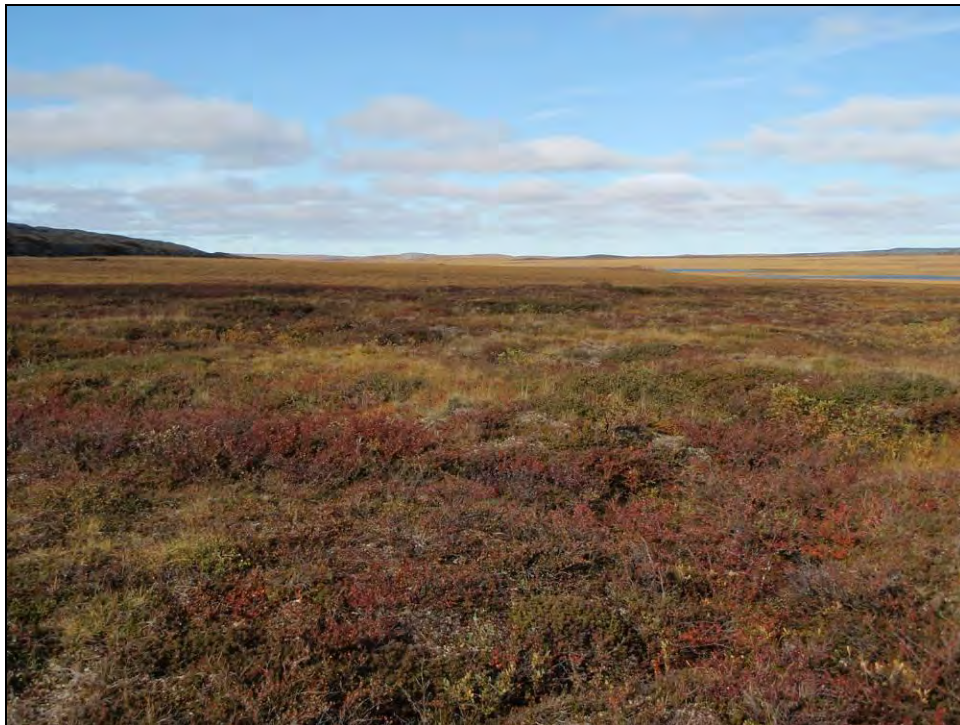


Plate 4.2-14. Raised bog or palsa in SMU O2 (Site D109).



Plate 4.2-15. Gleysolic Turbic Cryosol in SMU F (Site D032).



Plate 4.2-16. View of active fluvial floodplain (site D032).

4.2.6 Other Mapping Units

Very thin and non-soils occur throughout the study area. Non-soils consist of exposed bedrock or weathered bedrock overlying bedrock. Very thin soils consist of materials developed from various surficial materials including eolian, colluvial, and morainal deposits that may have some soil development, but not enough to classify them as soil. These soil mapping units occupy approximately 15% of the study area.

4.2.6.1 Soil Mapping Unit R

Soil Mapping Unit R consists of exposed bedrock (Plate 4.2-17) and thin veneers of weathered bedrock. Where soils are present, they are classified as rapidly drained Brunisols or Regosols. These soils are commonly seen in high relief areas where high energy washing has removed all overlying deposits. Subsequent weathering of this bedrock has resulted in very thin veneers of soil. Soil development is generally limited to less than 20 cm. These non-soil mapping units are most prevalent in the north end of the belt.

SMU R occupies approximately 9% of the study area.



Plate 4.2-17. View of exposed bedrock (Site 3 looking north).

4.2.6.2 Soil Mapping Unit V

Mapping Unit V is comprised of well to rapidly drained Brunisols and some Regosols (Plate 4.2-18). These soils are either eolian deposits or eroded (due to washing) morainal deposits resulting in very thin veneers (<20 cm) overlying bedrock (Plate 4.2-19). They are typically found in higher relief areas. Eolian veneers occur as non-stony sands. Morainal veneers occur as stony, sandy loam to loamy sand textured materials.

SMU V occupies approximately 6% of the study area.



Plate 4.2-18. Orthic Dystric Brunisol in SMU V (Site D053).



Plate 4.2-19. Typical landscape feature of SMU V, showing a thin morainal veneer over bedrock (Site D053).

4.3 SOIL ANALYTICAL RESULTS

The laboratory analysis for soil samples collected in the study area are appended (Appendix 4). A summary of the analytical results for soil reaction, total organic carbon, and metals are provided in the following subsections.

4.3.1 Soil Reaction (pH) and Total Organic Carbon

The mean average pH values for the soils collected from the study area are 5.8 (0 to 10 cm depth samples), and 6.2 (10 to 20 cm depth samples). Soil pH variability within each sample group is low (standard deviation = 0.7 pH units). The pH values ranged from 4.4 to 7.4 in the 0 to 10 cm depth and 4.1 to 7.7 in the 10 to 20 cm depth. The majority of the soil samples tested were slightly to strongly acid in the 0 to 10 cm depth, and slightly acid to mildly alkaline in the 10 to 20 cm depth.

Total organic carbon content ranged from 0.1% to 42.1%, by weight (Table 4.3-1). The mean average total organic carbon levels were 4.0% (0 to 10 cm depth samples) and 3.9% (10 to 20 cm depth samples). High organic carbon content was reported at Site #D109, an organic deposit. In general, the total organic carbon content of the surface samples (0 to 10 cm) is higher than in the subsurface samples, with only a few exceptions.

4.3.2 Metal Analysis

A summary of the results of metals analysis is outlined in Table 4.3-1.

All metal results are below the CCME Soil Quality Guidelines for the protection of environmental health (parkland and industrial guidelines). The CCME Soil Quality Guidelines were exceeded for chromium for the protection of human health (agricultural guidelines) at three sites (CCME 2010). Naturally elevated levels of chromium (Cr) were found at Sites D020, D021, and D023. These inspection sites are located in the North End of the Belt (Figure 2.3-1). The chromium values at these three sites in both the 0 to 10 cm and 10 to 20 cm depths exceed the chromium guideline for agriculture (64 mg/kg), but are below guidelines for all other uses. Elevated chromium at these sites ranged from 65.3 to 81.8 mg/kg.

4.4 SUMMARY

Based on the results from the terrain and soils program, soils that have developed from morainal, organic, and glaciomarine deposits dominate the study area. Approximately 32% of the surficial materials are morainal. Organic and glaciomarine materials represent 16% and 13% of the study area, respectively. Post-glacial, down-slope washing has resulted in mixed surficial materials, particularly in lower slope positions. In general, however, coarse morainal deposits occupy higher relief areas, whereas moderately fine textured glaciomarine deposits that are non-stony, have accumulated in valley bottoms and on plains.

Soils in the study area were grouped into eleven soil mapping units based on soil orders, surface expression, and drainage class. Soil mapping units identified in the study area include three morainal mapping units, two glaciomarine/glaciolacustrine/lacustrine mapping units, two organic mapping units, one fluvial mapping unit, one bedrock mapping unit, one thin veneer mapping unit (<20 cm of soil), and one marine beach unit. Morainal mapping units are the most dominant soil mapping units and occupy 30% of the study area.

Table 4.3-1. Summary of Metal Analytical Results

Sample ID					8		11		13		14	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					6.03	6.22	6.24	7.28	5.70	6.05	6.63	6.32
Organic Carbon												
Total Organic Carbon (%)					2.07	3.85	1.20	0.10	0.22	<0.10	1.10	1.47
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	93.2	106	19.2	60.5	15.3	22.6	117	112
Beryllium (Be)	04	04	08	08	<0.50	0.52	<0.50	<0.50	<0.50	<0.50	0.59	0.59
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	52.2	56.8	8.5	30.5	9.4	10.5	58.8	60.9
Cobalt (Co)	40	50	300	300	10.4	11.9	2.2	8.3	<2.0	3.1	13.8	13.5
Copper (Cu)	63	63	91	91	13.8	17.0	6.2	19.4	4.7	7.8	19.1	17.8
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	0.0107	0.0205	0.0064	<0.0050	<0.0050	<0.0050	0.0079	0.0069
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	23.3	27.3	<5.0	18.9	<5.0	5.3	29.8	29.4
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	58.0	63.5	16.8	35.6	16.7	17.6	64.6	66.6
Zinc (Zn)	200	200	360	360	47.4	54.8	10.5	25.1	8.4	10.4	51.3	52.0

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					16		18		21		22	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					6.59	7.05	6.27	6.42	6.46	6.42	6.46	7.52
Organic Carbon												
Total Organic Carbon (%)					1.22	7.32	0.97	0.85	1.52	2.92	0.98	0.17
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	13.8	109	46.3	53.5	127	135	33.6	69.4
Beryllium (Be)	04	04	08	08	<0.50	<0.50	<0.50	<0.50	0.61	0.63	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	7.6	41.8	29.2	33.1	65.3	65.8	34.5	42.7
Cobalt (Co)	40	50	300	300	2.0	9.3	5.4	5.9	13.6	14.4	9.2	11.3
Copper (Cu)	63	63	91	91	5.7	40.3	10.5	12.4	24.8	27.7	22.6	35.1
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	<0.0050	0.0239	<0.0050	<0.0050	0.0078	0.0099	0.0067	<0.0050
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	<5.0	28.5	14.8	17.3	32.3	34.7	23.2	30.2
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	14.0	41.3	32.9	37.2	72.7	72.0	35.2	46.0
Zinc (Zn)	200	200	360	360	6.9	36.4	23.8	29.0	57.1	61.2	22.8	37.9

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					23		29		D06		D10				
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20			
Physical Tests															
pH (pH units)					6.00	6.15	5.62	6.14	6.09	6.69	6.13	7.05			
Organic Carbon					1.78	2.61	5.89	3.34	1.36	0.71	0.60	0.20			
Total Organic Carbon (%)					1.78	2.61	5.89	3.34	1.36	0.71	0.60	0.20			
	CCME Metal Guidelines for the Protection of Environmental and Human Health														
Metals	Agricultural	Parkland	Commercial	Industrial											
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10			
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.6			
Barium (Ba)	750	500	2000	2000	134	131	71.0	128	82.7	76.2	21.8	29.2			
Beryllium (Be)	04	04	08	08	0.66	0.65	<0.50	0.56	<0.50	<0.50	<0.50	<0.50			
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Chromium (Cr)	64	64	87	87	65.6	67.2	35.8	59.4	47.6	48.1	23.8	22.1			
Cobalt (Co)	40	50	300	300	12.9	14.7	8.7	13.7	9.8	11.9	7.9	8.3			
Copper (Cu)	63	63	91	91	26.2	25.6	15.3	27.6	20.1	16.9	21.3	31.4			
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30			
Mercury (Hg)	07	07	24	50	0.0101	0.0106	0.0273	0.0084	0.0094	<0.0050	0.0069	<0.0050			
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0			
Nickel (Ni)	50	50	50	50	35.0	35.7	19.7	32.0	24.7	25.2	15.2	16.0			
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0			
Vanadium (V)	130	130	130	130	71.7	73.3	43.6	69.9	51.2	50.9	32.0	32.8			
Zinc (Zn)	200	200	360	360	59.0	61.0	36.8	59.4	44.7	39.7	25.3	30.1			

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					D20		D21		D29		D32	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					7.35	7.67	5.17	5.56	6.45	6.17	5.09	5.44
Organic Carbon												
Total Organic Carbon (%)					11.1	4.25	3.74	2.25	4.08	3.43	1.02	1.09
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	5.2	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	81.4	39.7	112	107	100	121	39.7	44.0
Beryllium (Be)	04	04	08	08	<0.50	<0.50	0.64	0.59	0.53	0.58	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	81.8	74.5	62.8	58.6	51.8	60.6	26.2	25.7
Cobalt (Co)	40	50	300	300	16.7	17.1	11.4	10.1	10.3	12.9	6.1	5.2
Copper (Cu)	63	63	91	91	38.2	67.7	25.4	24.4	28.4	31.0	12.1	13.8
Lead (Pb)	70	140	260	600	<30	<30	<30	<30		<30	<30	<30
Mercury (Hg)	07	07	24	50	0.0543	0.0155	0.0159	0.0100	0.0263	0.0141	0.0056	0.0082
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	53.5	48.3	31.1	28.6	26.2	32.5	14.6	14.1
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	46.3	50.3	64.3	60.2	53.8	64.6	31.8	29.2
Zinc (Zn)	200	200	360	360	47.1	46.5	54.2	50.4	55.8	60.9	28.9	30.6

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					D38		D43		D54		D57	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					5.17	5.69	7.15	7.64	5.28	5.79	5.91	6.16
Organic Carbon												
Total Organic Carbon (%)					0.71	0.19	4.20	3.21	19.3	36.4	4.77	2.40
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	12.8	15.4	93.0	102	36.0	48.4	116	136
Beryllium (Be)	04	04	08	08	<0.50	<0.50	0.56	0.53	<0.50	<0.50	0.56	0.63
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	8.2	9.6	45.7	43.6	<2.0	5.8	53.0	62.4
Cobalt (Co)	40	50	300	300	2.7	3.6	9.4	8.9	3.6	5.8	11.5	13.2
Copper (Cu)	63	63	91	91	2.5	3.7	16.5	21.8	5.6	9.1	23.8	26.5
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	<0.0050	<0.0050	0.0175	0.0108	0.158	0.0695	0.0165	0.0091
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	<5.0	5.3	24.3	23.5	<5.0	15.1	28.1	34.4
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	19.1	20.9	47.2	47.2	<2.0	9.4	57.3	64.9
Zinc (Zn)	200	200	360	360	10.7	11.6	51.0	48.6	26.5	9.0	50.9	59.1

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					D59		D65		D61		D70	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					6.70	7.05	5.56	4.92	6.26	6.30	6.03	6.15
Organic Carbon												
Total Organic Carbon (%)					0.53	0.26	0.24	3.83	5.92	1.26	2.76	1.68
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	22.4	21.7	16.6	18.1	77.1	60.0	21.3	20.5
Beryllium (Be)	04	04	08	08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	17.5	13.8	8.8	12.0	41.3	34.7	9.0	9.0
Cobalt (Co)	40	50	300	300	6.2	4.9	<2.0	2.6	7.2	6.6	<2.0	<2.0
Copper (Cu)	63	63	91	91	22.1	16.2	5.2	4.8	13.0	12.6	5.9	4.7
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	<0.0050	<0.0050	<0.0050	0.0129	0.0201	0.0059	0.0099	<0.0050
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	15.2	10.5	<5.0	5.4	20.0	16.0	<5.0	<5.0
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	23.7	20.9	14.3	17.5	43.3	40.3	15.1	13.3
Zinc (Zn)	200	200	360	360	18.4	15.5	7.8	11.2	57.3	33.7	9.6	8.9

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					D72		D76		D82		D88	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					4.53	5.09	4.96	5.67	5.90	5.95	5.30	5.87
Organic Carbon												
Total Organic Carbon (%)					2.59	2.54	3.27	1.64	0.76	1.61	0.77	0.25
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	73.1	81.9	102	52.6	17.8	23.1	18.3	19.1
Beryllium (Be)	04	04	08	08	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	47.1	47.9	39.9	22.8	11.1	10.6	8.5	8.2
Cobalt (Co)	40	50	300	300	6.4	6.6	8.4	5.0	2.2	2.6	2.7	3.0
Copper (Cu)	63	63	91	91	28.6	30.4	26.2	12.7	4.4	7.0	5.7	18.4
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	0.0193	0.0116	0.0206	0.0065	<0.0050	0.0071	<0.0050	<0.0050
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	17.4	18.0	20.8	10.9	<5.0	<5.0	<5.0	<5.0
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	50.6	50.3	46.0	30.1	19.4	20.0	16.4	14.9
Zinc (Zn)	200	200	360	360	34.6	35.4	46.3	22.9	8.8	9.8	9.9	8.3

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (continued)

Sample ID					D96		D99		D108		D109	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests												
pH (pH units)					4.40	6.35	6.53	6.40	5.68	5.60	5.48	4.13
Organic Carbon												
Total Organic Carbon (%)					0.50	0.20	1.45	1.49	5.64	4.31	42.1	34.1
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health											
	Agricultural	Parkland	Commercial	Industrial								
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	9.3	9.5	104	105	30.2	30.3	24.0	33.7
Beryllium (Be)	04	04	08	08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	6.5	6.5	46.3	47.3	24.3	23.7	<2.0	14.5
Cobalt (Co)	40	50	300	300	<2.0	<2.0	8.8	10.2	9.0	6.4	<2.0	2.3
Copper (Cu)	63	63	91	91	1.6	1.3	18.8	17.7	20.9	23.7	4.3	4.9
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	<0.0050	<0.0050	0.0079	0.0090	0.0504	0.0620	0.104	0.0442
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	<5.0	<5.0	21.6	21.7	15.9	12.8	<5.0	8.1
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	9.9	10.2	53.2	54.2	36.0	30.7	2.5	14.6
Zinc (Zn)	200	200	360	360	9.7	7.3	46.2	48.4	38.6	26.7	17.3	10.6

Note:

(continued)

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

Table 4.3-1. Summary of Metal Analytical Results (completed)

Sample ID					D119		D122		D132	
Sample Depth (cm)					0-10	10-20	0-10	10-20	0-10	10-20
Physical Tests										
pH (pH units)					5.08	5.50	5.02	5.94	5.09	6.17
Organic Carbon										
Total Organic Carbon (%)					0.46	0.49	2.42	2.71	1.67	0.43
Metals	CCME Metal Guidelines for the Protection of Environmental and Human Health									
	Agricultural	Parkland	Commercial	Industrial						
Antimony (Sb)	20	20	40	40	<10	<10	<10	<10	<10	<10
Arsenic (As)	12	12	12	12	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium (Ba)	750	500	2000	2000	21.3	28.0	35.0	46.1	21.4	15.1
Beryllium (Be)	04	04	08	08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cadmium (Cd)	01	10	22	22	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	64	64	87	87	10.3	13.1	18.6	24.9	10.5	9.2
Cobalt (Co)	40	50	300	300	<2.0	2.5	3.2	3.7	3.4	2.4
Copper (Cu)	63	63	91	91	2.3	5.7	6.9	8.8	9.1	7.1
Lead (Pb)	70	140	260	600	<30	<30	<30	<30	<30	<30
Mercury (Hg)	07	07	24	50	<0.0050	<0.0050	0.0099	0.0160	0.0117	<0.0050
Molybdenum (Mo)	05	10	40	40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Nickel (Ni)	50	50	50	50	<5.0	5.0	8.3	10.9	5.6	<5.0
Selenium (Se)	01	01	03	03	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver (Ag)	20	20	40	40	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium (Tl)	01	01	01	01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin (Sn)	05	50	300	300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium (V)	130	130	130	130	19.8	20.7	21.7	27.3	16.7	15.3
Zinc (Zn)	200	200	360	360	9.9	12.2	23.3	33.4	9.6	7.7

Note:

All results are in mg/kg unless otherwise noted

	exceeds CCME Industrial guidelines
	exceeds CCME Commercial guidelines
	exceeds CCME Residential/Parkland guidelines
	exceeds CCME Agricultural guidelines

The dominant soils in the study area are classified as Cryosols and Brunisols. Cryosols generally had a permafrost layer within 30 to 60 cm of the surface and are imperfectly to poorly drained. They are typically associated with finer textured deposits and occur in lower landscape positions. Brunisols generally do not have a permafrost layer within the upper metre of the soil profile. They are usually moderately well to rapidly drained and occur in upper landscape positions and are typically coarse textured. Other less common soils are poorly drained Gleysols and well-drained Regosols.

Soil analytical results indicate that the soils in the study area are mildly alkaline to strongly acid. The soils generally have low organic carbon content, with the exception of organic soils. Metal concentrations in the study area are below CCME Soil Quality Guidelines for the protection of environmental health. The CCME Soil Quality Guidelines for the protection of human health were exceeded for chromium at three sample sites.

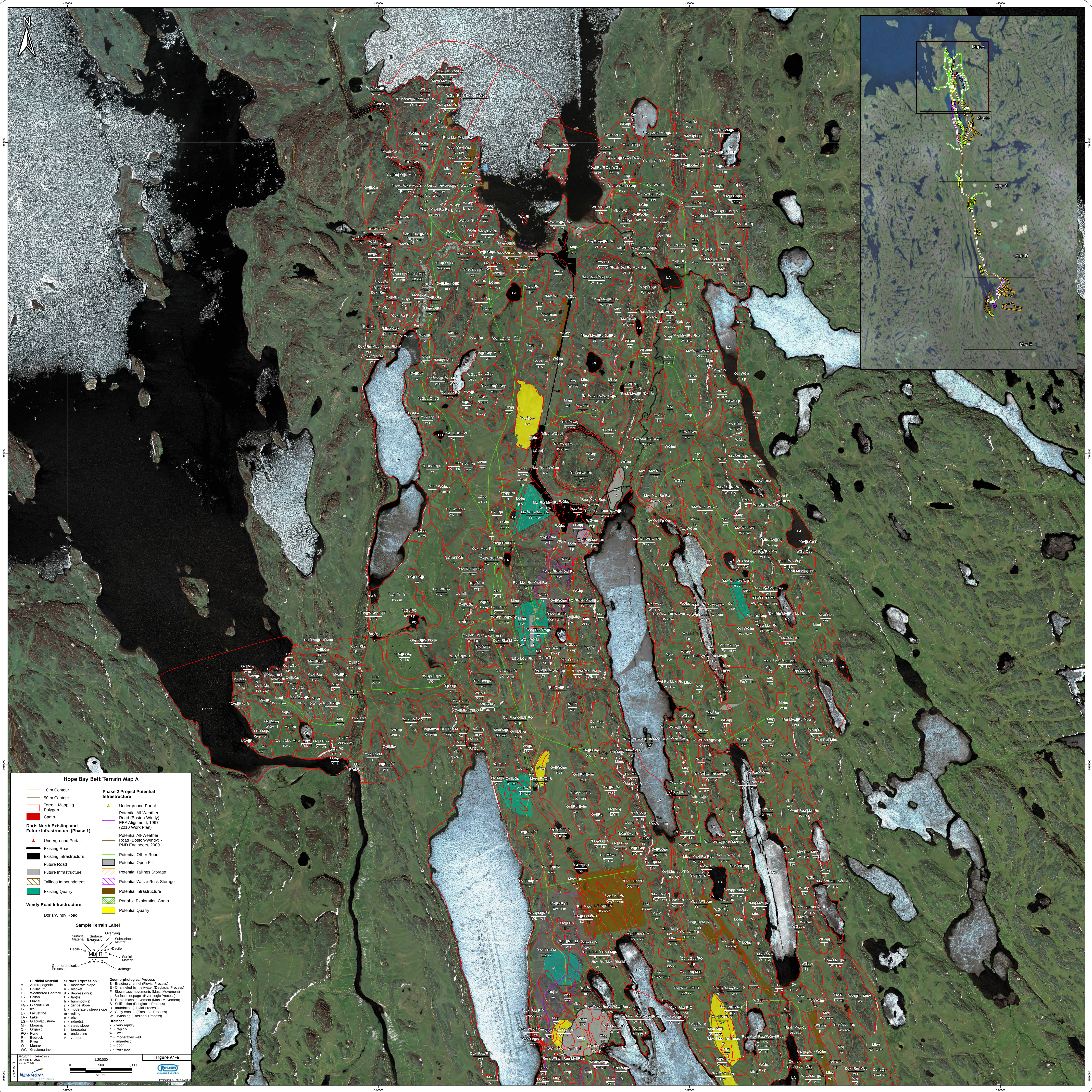
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Appendix 1

Terrain Maps



10 m Contour

50 m Contour

Terrain Mapping Polygon

Camp

Underground Portal

Existing Road

Existing Infrastructure

Future Road

Future Infrastructure

Tailings Impoundment

Existing Quarry

Windy Road Infrastructure

Doris/Windy Road

Phase 2 Project Potential Infrastructure

Underground Portal

Potential All-Weather Road (Boston-Windy) - EBA Alignment, 1997 (2010 Work Plan)

Potential All-Weather Road (Boston-Windy) - PND Engineers, 2009

Potential Other Road

Potential Open Pit

Potential Tailings Storage

Potential Waste Rock Storage

Potential Infrastructure

Portable Exploration Camp

Potential Quarry

Sample Terrain Label

Surficial Material

Surface Expression

Overlying

Subsurface

Drainage

Surficial Material

Surface Expression

Overlying

Subsurface

Drainage

Surficial Material

Surface Expression

Geomorphological Process

A - Alluvium

B - Blasted

C - Colluvium

D - Weathered Bedrock

E - Eolian

F - Fluvial

G - Glacioclastic

H - Hummocky

I - Ice

J - Lacustrine

K - Lake

L - Lacustrine

M - Moraine

N - Organic

O - Pond

P - Bedrock

Q - River

R - River

S - River

T - River

U - River

V - River

W - River

X - River

Y - River

Z - River

B - Blasted

C - Blasted

D - Blasted

E - Blasted

F - Blasted

G - Blasted

H - Blasted

I - Blasted

J - Blasted

K - Blasted

L - Blasted

M - Blasted

N - Blasted

O - Blasted

P - Blasted

Q - Blasted

R - Blasted

S - Blasted

T - Blasted

U - Blasted

V - Blasted

W - Blasted

X - Blasted

Y - Blasted

Z - Blasted

Geomorphological Process

A - Alluvium

B - Blasted

C - Colluvium

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E - Eolian

F - Fluvial

G - Glacioclastic

H - Hummocky

I - Ice

J - Lacustrine

K - Lake

L - Lacustrine

M - Moraine

N - Organic

O - Pond

P - Bedrock

Q - River

R - River

S - River

T - River

U - River

V - River

W - River

X - River

Y - River

Z - River

B - Blasted

C - Blasted

D - Blasted

E - Blasted

F - Blasted

G - Blasted

H - Blasted

I - Blasted

J - Blasted

K - Blasted

L - Blasted

M - Blasted

N - Blasted

O - Blasted

P - Blasted

Q - Blasted

R - Blasted

S - Blasted

T - Blasted

U - Blasted

V - Blasted

W - Blasted

X - Blasted

Y - Blasted

Z - Blasted

PROJECT: 1009-003-13

DATE: 15-09-2011

NEWMONT

Figure A1-a

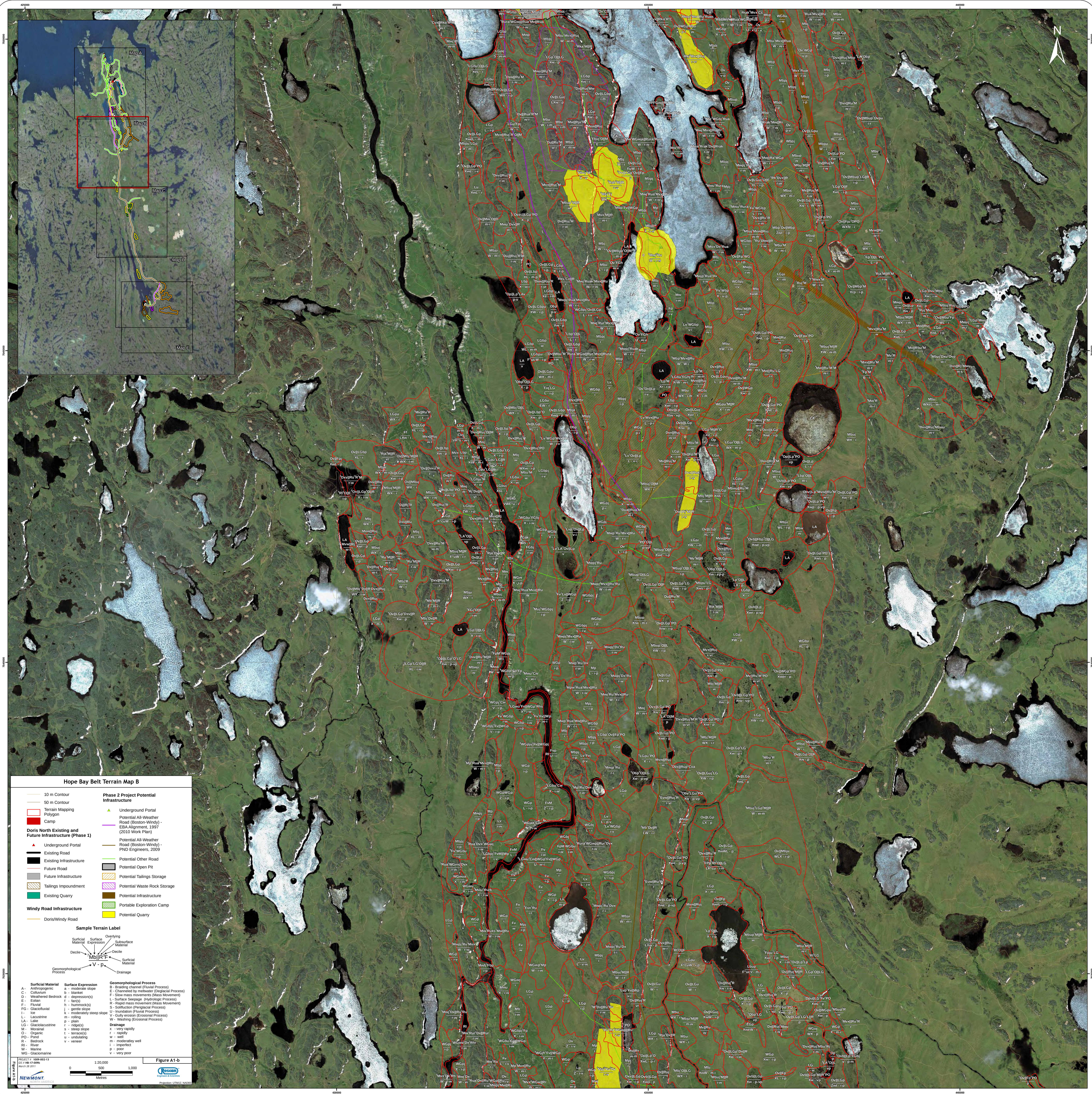
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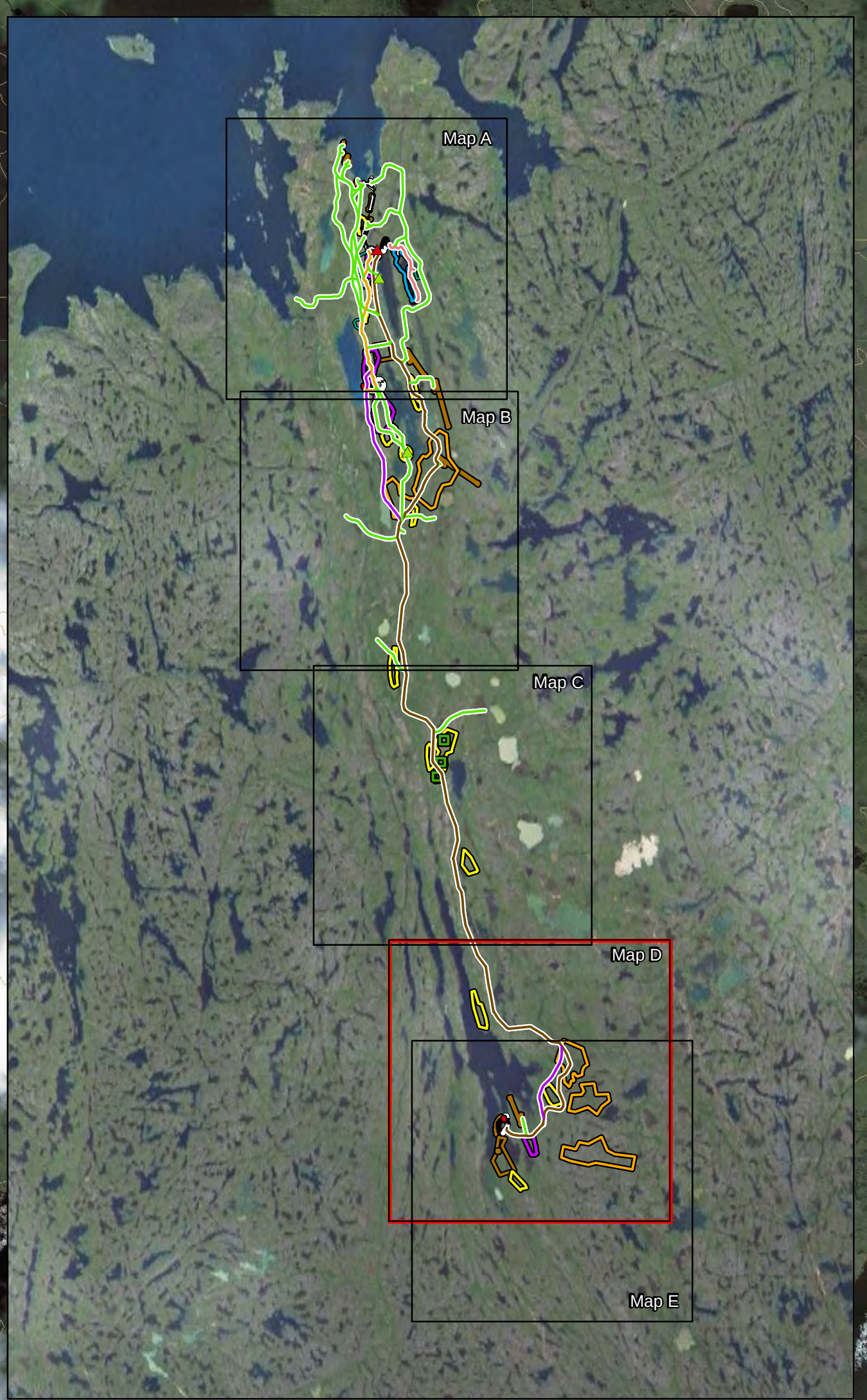
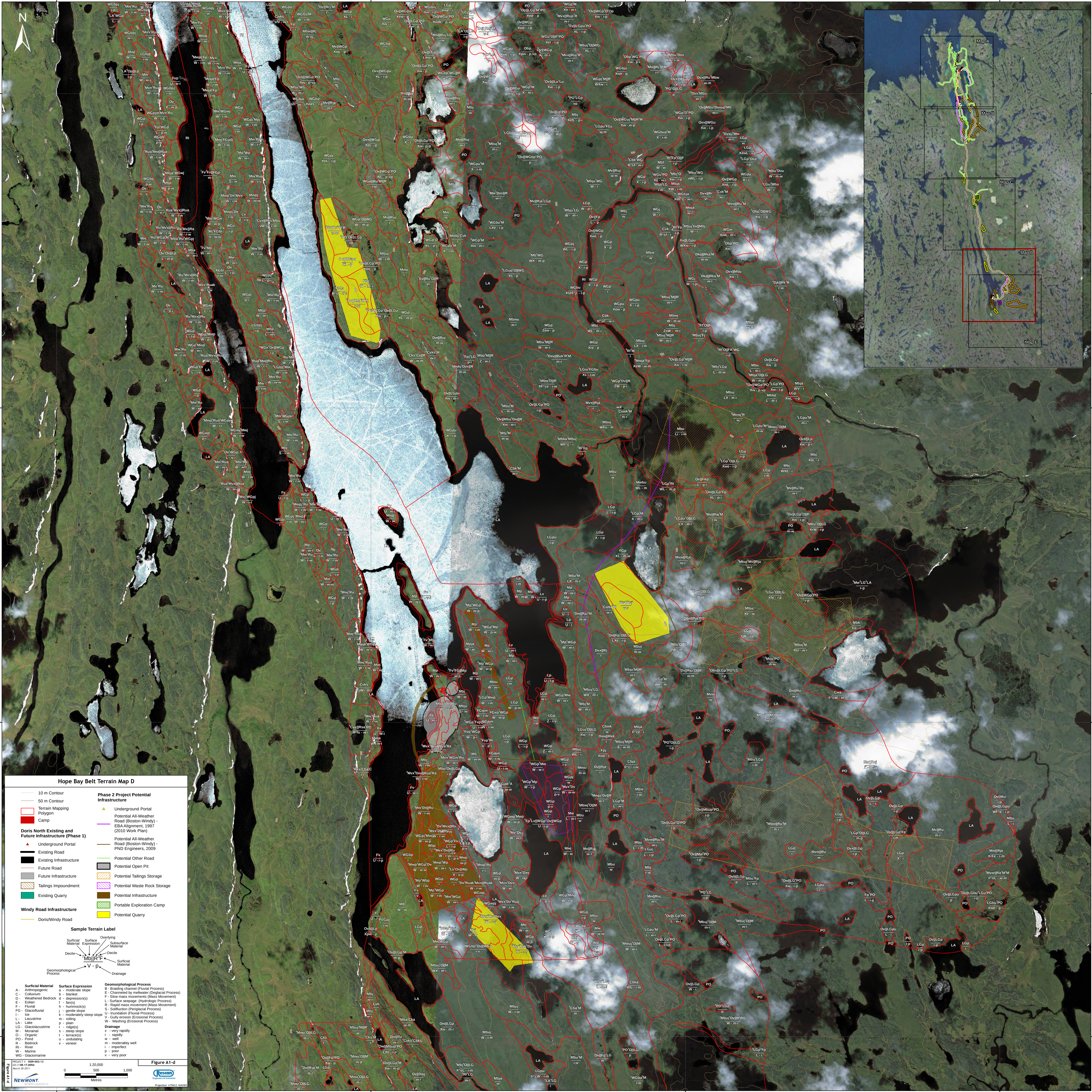
Metres

Figure A1-a

Rescon

Engineers & Scientists





10 m Contour

50 m Contour

Terrain Mapping Polygon

Camp

Doris North Existing and Future Infrastructure (Phase 1)

Underground Portal

Existing Road

Future Road

Future Infrastructure

Tailings Impoundment

Existing Quarry

Windy Road Infrastructure

Doris/Windy Road

Phase 2 Project Potential Infrastructure

Underground Portal

Potential All-Weather Road (Boston-Windy) - EBA Alignment, 1997 (2010 Work Plan)

Potential All-Weather Road (Boston-Windy) - PND Engineers, 2009

Potential Other Road

Potential Open Pit

Potential Tailings Storage

Potential Waste Rock Storage

Potential Infrastructure

Portable Exploration Camp

Potential Quarry

Sample Terrain Label

Surficial Material

Surface Expression

Geomorphological Process

PROJECT: 1-1000-0013

DATE: 14-09-2013

SCALE: 1:20,000

0 500 1,000

Meters

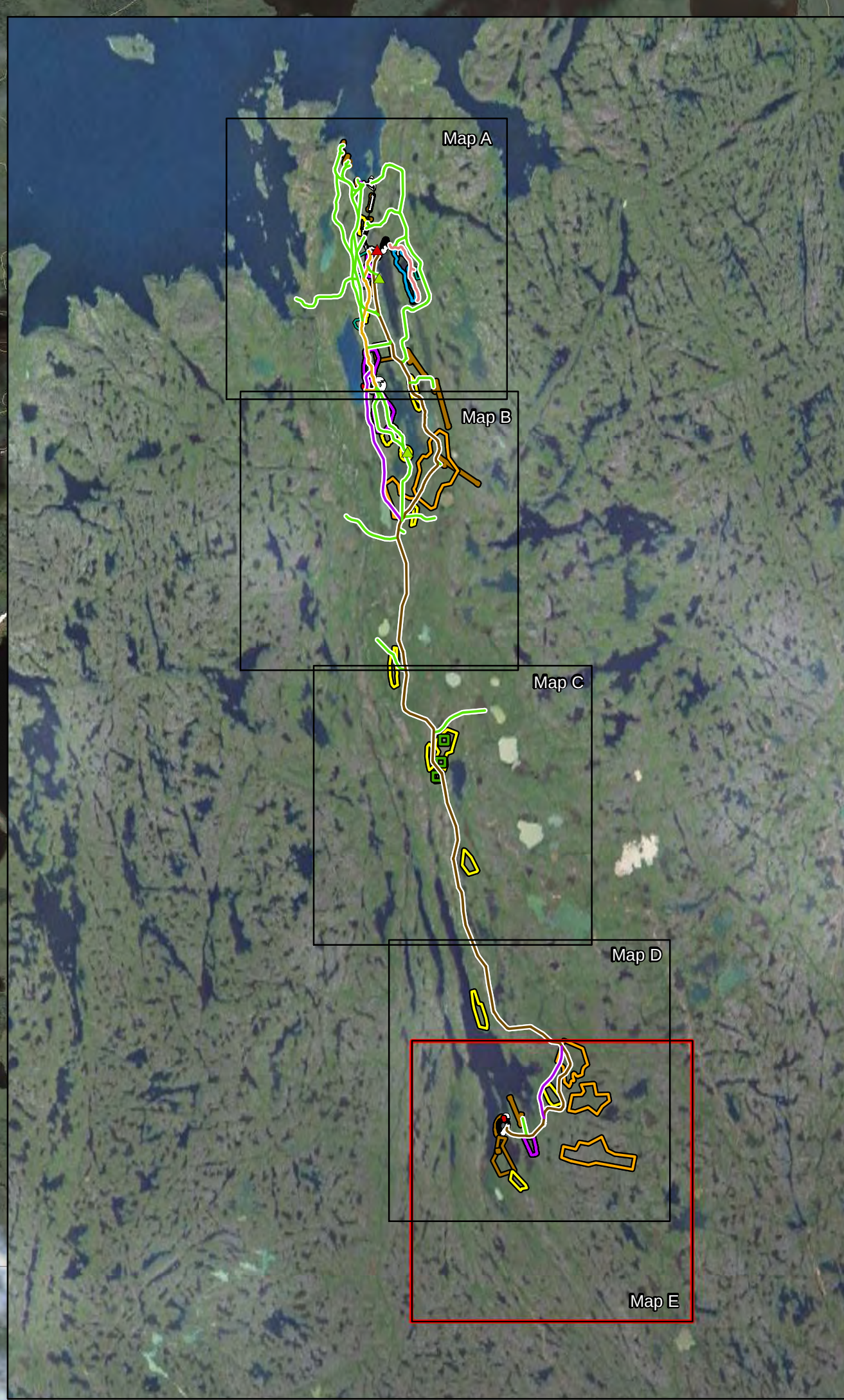
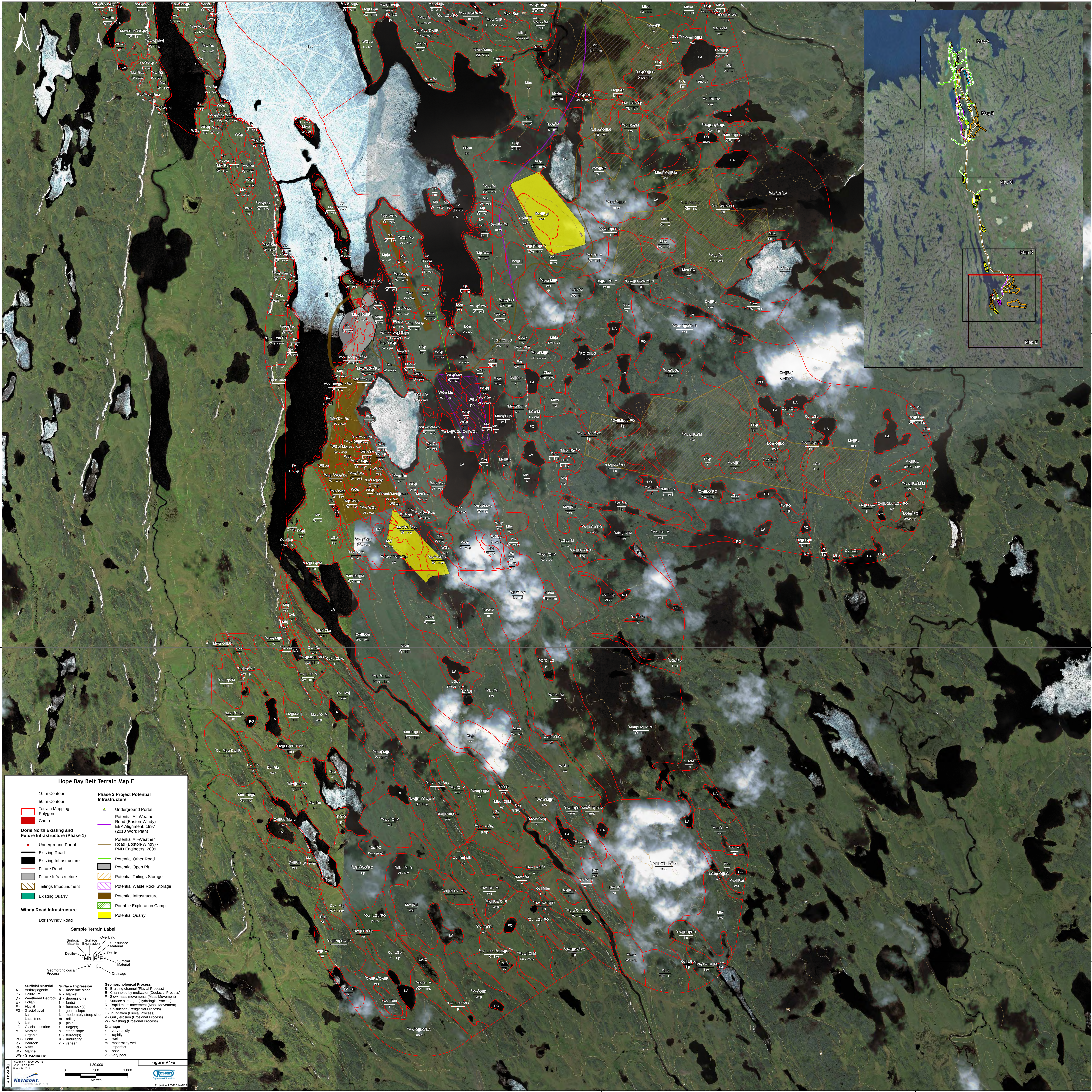
Figure A1-d

Rescon

Engineers & Scientists

PROFESSIONAL ENGINEER

Surficial Material	Surface Expression	Geomorphological Process
A - Alluvium	B - Blanket	B - Blasting channel (Fluvial Process)
C - Colluvium	D - Depression(s)	E - Channelled by meltwater (Deglacial Process)
D - Weathered Bedrock	E - Eolian	F - Slow mass movements (Mass Movement)
E - Estuary	F - Fluvial	G - Surface seepage (Hydrologic Process)
F - Glacioclastic	G - Hummock(s)	H - Rapid mass movement (Mass Movement)
G - Lacustrine	H - Gentle slope	I - Sublimation (Periglacial Process)
H - Lacustrine	I - Ice	J - Foundation (Fluvial Process)
I - Lacustrine	J - Lacustrine	K - Gully erosion (Erosional Process)
J - Lacustrine	K - Lacustrine	L - Washing (Erosional Process)
K - Lacustrine	L - Lacustrine	M - Washing
L - Lacustrine	M - Lacustrine	N - Washing
M - Lacustrine	N - Lacustrine	O - Washing
N - Lacustrine	O - Lacustrine	P - Washing
O - Lacustrine	P - Lacustrine	Q - Washing
P - Lacustrine	Q - Lacustrine	R - Washing
Q - Lacustrine	R - Lacustrine	S - Washing
R - Lacustrine	S - Lacustrine	T - Washing
S - Lacustrine	T - Lacustrine	U - Washing
T - Lacustrine	U - Lacustrine	V - Washing
U - Lacustrine	V - Lacustrine	W - Washing
V - Lacustrine	W - Lacustrine	X - Washing
W - Lacustrine	X - Lacustrine	Y - Washing
X - Lacustrine	Y - Lacustrine	Z - Washing
Y - Lacustrine	Z - Lacustrine	
Z - Lacustrine		



Hope Bay Belt Terrain Map E

Doris North Existing and Future Infrastructure (Phase 1)

- Underground Portal
- Existing Road
- Existing Infrastructure
- Future Road
- Future Infrastructure
- Tailings Impoundment
- Existing Quarry
- Windy Road Infrastructure
- Doris/Windy Road

Phase 2 Project Potential Infrastructure

- Underground Portal
- Potential All-Weather Road (Boston-Windy) - EBA Alignment, 1997 (2010 Work Plan)
- Potential All-Weather Road (Boston-Windy) - PND Engineers, 2009
- Potential Other Road
- Potential Open Pit
- Potential Tailings Storage
- Potential Waste Rock Storage
- Potential Infrastructure
- Portable Exploration Camp
- Potential Quarry

Sample Terrain Label

Surficial Material: A - Alluvial, B - Blanket, C - Colluvium, D - Weathered Bedrock, E - Eolian, F - Fluvial, G - Glacial, H - Hummock(s), I - Ice, J - Lacustrine, K - Lacustrine, L - Lake, M - Lacustrine, N - Lacustrine, O - Organic, P - Pond, Q - River, R - River, S - Marine, T - Marine, U - Marine, V - Marine, W - Marine, X - Marine, Y - Marine, Z - Marine.

Surface Expression: A - Alluvial, B - Blanket, C - Colluvium, D - Weathered Bedrock, E - Eolian, F - Fluvial, G - Glacial, H - Hummock(s), I - Ice, J - Lacustrine, K - Lacustrine, L - Lake, M - Lacustrine, N - Lacustrine, O - Organic, P - Pond, Q - River, R - River, S - Marine, T - Marine, U - Marine, V - Marine, W - Marine, X - Marine, Y - Marine, Z - Marine.

Geomorphological Process: A - Alluvial, B - Blanket, C - Colluvium, D - Weathered Bedrock, E - Eolian, F - Fluvial, G - Glacial, H - Hummock(s), I - Ice, J - Lacustrine, K - Lacustrine, L - Lake, M - Lacustrine, N - Lacustrine, O - Organic, P - Pond, Q - River, R - River, S - Marine, T - Marine, U - Marine, V - Marine, W - Marine, X - Marine, Y - Marine, Z - Marine.

Figure A1-e

0 500 1,000 Metres

NEWMONT

Rescon

Figure A1-e

Appendix 2

Detailed Soil Inspections

Appendix 2a. Site Data

Site ID	Date	Northing	Easting	Elevation	Surficial Material		Ground Cover			Surficial Expression			Humus Order	Drainage	Mesoslope
					Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3			
01	7/11/2010	7562225	431794	7	Moraine	Lacustrine	0.5		100	blanket	thickness		Mull	very poor	
02	7/11/2010	7562513	431501	775	Moraine	Bedrock	25	NE	80	hummocky	undulating	veneer	Moder	well	
03	7/11/2010	7562314	431145		Bedrock	Weathered Bedrock	25		0	ridge			None		
04	7/12/2010	7557681	431600	41	Moraine		2.5	SE	100	blanket			Moder	moderately well	
05	7/12/2010	7557566	431712	43	Lacustrine	Fluvial	0	-	100	undulating	blanket		Moder	imperfect	
06	7/12/2010	7557078	431717	61	Bedrock	Weathered Bedrock	48	Crest	0	ridge			None	very rapid	
07	7/12/2010	7556703	431919	69	Moraine		10	N	10	undulating	blanket		Moder	well	
08	7/12/2010	7556490	431889	62	Lacustrine		8	W	100	blanket			Moder	imperfect	
09	7/14/2010	7507188	448193	111	Organic	Moraine	2.5	S	100	d	veneer		Mull	imperfect	
10	7/14/2010	7507247	447631	122	Moraine	Weathered Bedrock	0	-	70	ridge	undulating	veneer	Moder	rapid	
11	7/14/2010	7506863	447111	116	Moraine	Glaciolacustrine	0	-	70	blanket			Moder	well	
12	7/14/2010	7506395	446209	113	Moraine	Glaciolacustrine	0		100	blanket			Moder	poor	
13	7/14/2010	7506296	445764	94	Moraine		8		70	undulating	blanket		Mull	moderately well	
14	7/15/2010	7547927	437081	45	Glaciolacustrine		5	W	100	blanket			Moder	imperfect	
15	7/15/2010	7547734	437131	57	Moraine	Weathered Bedrock	10	N		ridge	veneer		Moder	rapid	
16	7/15/2010	7547392	437606	53	Moraine	Bedrock	10	S	80	ridge	blanket		Mull	imperfect	
17	7/15/2010	7547059	437790	38	Organic		0		100	blanket			Moder	very poor	
18	7/15/2010	7546759	437685	41	Glaciolacustrine		2.5	E	100	blanket			Mull	imperfect	
19	7/15/2010	7546321	437579	65	Moraine	Weathered Bedrock	10	NE	30	ridge	undulating	veneer	Moder	rapid	
20	7/15/2010	7546153	437459	47	Moraine		10	NW	60	blanket			Moder	imperfect	
21	7/16/2010	7559766	431742	19	Glaciolacustrine		0		100	blanket			Mull	imperfect	
22	7/16/2010	7559736	431495	41	Glaciomarine	Bedrock	2.5	S	70				Mull	imperfect	
23	7/16/2010	7553440	434866	27	Glaciomarine		5	W	100	plain	blanket		Moder	poor	
24	7/16/2010	7553215	435038	65	Moraine	Bedrock	67	W	100	ridge	thickness		Mull	well	
25	7/16/2010	7552926	435165	61	Weathered bedrock	Bedrock	5	NW		veneer			Moder	very rapid	
26	7/16/2010	7552562	435184	47	Lacustrine		0		100	blanket			Moder	poor	
27	7/16/2010	7552176	435154	46	Lacustrine		2.5	NW	100	plain	blanket		Moder	poor	
28	7/18/2010	7557943	436537	14	Lacustrine		0		100	plain	blanket		Mull	imperfect	
29	7/18/2010	7557974	436397	25	Lacustrine		15	E	100	blanket			Mull	imperfect	
30	7/18/2010	7557597	436232	28	Moraine		47	NE	60	ridge	blanket		Mull	very rapid	
96 17329	7/29/1996	7560188	433139		Glaciomarine	Bedrock	18	154		veneer	veneer		Mull	well	upper
96 17330	7/29/1996	7559932	433299		Glaciomarine		0		85	plain	hummocky		None	very poor	level
96 17331	8/1/1996	7505196	443175		Glaciomarine		2	315		plain			Moder	imperfect	middle
96 17332	8/2/1996	7564220	430838		Glaciomarine		5	188		plain	gentle slope		Moder	well	
96 17333	7/31/1996	7559165	434233		Organic		0			plain				very poor	depression
96 17334	7/31/1996	7559232	434434		Moraine		18	256		thickness	gentle slope		Moder	moderately well	crest
96 17335	7/31/1996	7558567	434434		Glaciomarine		1	266		plain			Moder	moderately well	level
96 17336	8/1/1996	7557639	432605		Glaciomarine		0			plain			Moder	very poor	level
96 17339	8/2/1996	7565190	431179		Glaciomarine		7	8		veneer	blanket	gentle slope	None	very poor	toe
96 17340	8/2/1996	7564484	431588		Glaciomarine		10	52		thickness	gentle slope		None	rapid	upper
96 17341	8/3/1996	7537344	433513		Fluvial	Glaciomarine	2	10		veneer	plain		None	imperfect	lower
96 17342	8/2/1996	7564224	430950		Glaciomarine	Bedrock	8	141		veneer	gentle slope	hummocky	Moder	well	crest
96 17343	8/2/1996	7563279	431138		Glaciomarine		10	8		thickness	gentle slope		None	well	middle
96 17344	8/4/1996	7526766	433426		Moraine		4	10		blanket	plain	gentle slope	Moder	well	
96 17345	8/3/1996	7527066	433327		Glaciomarine		5	120		plain	gentle slope		Moder	poor	lower
96 17346	8/4/1996	7528506	432964		Fluvial	Glaciomarine	6	80		veneer	gentle slope	plain	Moder	moderately well	level
96 17347	8/4/1996	7522467	435712		Glaciomarine		1.5	236		plain			Moder	poor	level
96 17348	8/5/1996	7541429	432923		Glaciomarine		9	274		thickness	veneer	gentle slope	Moder	moderately well	middle

Appendix 2a. Site Data

					Surficial Matarial		Ground Cover			Surficial Expression			Humus		
Site ID	Date	Northing	Easting	Elevation	Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3	Order	Drainage	Mesoslope
96 17349	8/3/1996	7537061	433357		Glaciomarine		0			plain			Mor	moderately well	
96 17350	8/5/1996	7538539	433302		Fluvial	Glaciomarine	2	67		plain				well	lower
96 17351	8/3/1996	7527289	433068		Glaciomarine	Moraine	4	90		thickness	blanket		Mor	moderately well	upper
96 17352	8/3/1996	7527280	433173		Moraine	Bedrock	13	120		thickness	gentle slope	hummocky	Mor	moderately well	crest
96 17353	8/4/1996	7524260	435775		Glaciomarine	Glaciofluvial	2	265		plain			Mor	moderately well	
96 17354	8/6/1996	7562408	434496		Moraine	Bedrock	32	100		veneer			Mor	well	crest
96 17355	8/4/1996	7527113	433402		Fluvial	Glaciomarine	1.5	42		plain			None	very poor	
96 17356	8/4/1996	7523860	435467		Glaciomarine		3	275		plain			Mor	imperfect	middle
96 17358	8/7/1996	7530111	432434		Glaciofluvial		7	210		blanket	plain		None	rapid	
96 17359	8/6/1996	7562384	434574		Glaciomarine		5	100		plain	gentle slope		Mor	very poor	crest
96 17360	8/6/1996	7562240	434681		Glaciofluvial		17	340		hummocky	gentle slope			rapid	middle
96 17361	8/6/1996	7557450	433507		Glaciomarine		5	12		thickness	gentle slope		Mor	imperfect	middle
96 17362	8/6/1996	7556996	433589		Glaciomarine		11	65		thickness	gentle slope		Mor	moderately well	crest
96 17363	8/7/1996	7529620	432729		Fluvial	Glaciomarine	0.5	244		veneer	plain		Mor	very poor	level
96 17364	8/7/1996	7529005	433139		Fluvial	Glaciomarine	6	248		veneer	plain		None	moderately well	level
96 17365	8/7/1996	7527989	433344		Eolian		0	0					None	well	crest
96 17366	8/2/1996	7564340	431338		Moraine	Colluvial	25	164		veneer	slope		Mor	well	crest
96 17367	8/7/1996	7528700	433411		Organic	Moraine	1.5	206		veneer	plain		Moder	very poor	depression
96 17368	8/7/1996	7528779	433483		Organic		1	206		plain			Mor	poor	
96 17369	8/12/1996	7535394	432363		Fluvial	Glaciomarine	11	252		veneer	plain			imperfect	toe
96 17370	8/13/1996	7532740	433894		Fluvial	Glaciomarine	7	358		veneer	gentle slope	plain		well	level
96 17371	8/13/1996	7533513	432660		Moraine		1.5	352		plain			Mor	poor	level
96 17372	8/5/1996	7541023	433379		Moraine		1	116		plain			Mor	poor	level
96 17373	8/5/1996	7541228	433342		Glaciomarine		1.5	80		plain			Mor	imperfect	level
96 17374	8/5/1996	7541532	433734		Organic	Glaciomarine	0	0		veneer	plain		Mor	very poor	level
96 17375	8/5/1996	7541739	433666		Glaciomarine		0	0		plain			Mor	very poor	level
96 17376	8/7/1996	7526834	434841		Glaciofluvial	Glaciomarine	0	0		veneer			None	rapid	crest
96 17377	8/6/1996	7563862	433582		Glaciomarine		1	302		plain			None	very poor	toe
96 17378	8/6/1996	7564330	433707		Glaciomarine		0	0		plain			None	well	level
96 17379	8/6/1996	7564285	433707		Glaciomarine		1	240		plain			None	very poor	level
96 17380	8/10/1996	7509349	437935		Glaciomarine		6	104		gentle slope			Mor	poor	lower
96 17381	8/10/1996	7511231	436820		Moraine		3	166		blanket			Mor	well	crest
96 17382	8/10/1996	7511541	437367		Glaciomarine		6.5	98		veneer	gentle slope		Mor	very poor	depression
96 17383	8/11/1996	7521601	435106		Fluvial	Glaciomarine	3.5	56		veneer	plain		Mor	imperfect	toe
96 17384	8/10/1996	7508673	438036		Moraine		5.5	136		veneer	gentle slope		Mor	poor	lower
96 17385	8/8/1996	7501757	440116		Glaciofluvial		1	220		blanket			Mull	imperfect	level
96 17386	8/8/1996	7501494	440484		Moraine		7	284		blanket			Mor	well	crest
96 17387	8/8/1996	7502520	440417		Moraine		1	352		blanket			Mull	well	upper
96 17388	8/8/1996	7501562	441432		Moraine		2	144		blanket			None	well	upper
96 17389	8/8/1996	7502451	441099		Glaciomarine		0	0					Mor	imperfect	level
96 17390	8/9/1996	7504427	440941		Weathered bedrock		6	312		veneer			Mor	well	crest
96 17391	8/9/1996	7504638	441611		Moraine		6	90		blanket			Mor	moderately well	crest
96 17392	8/9/1996	7504298	441919		Fluvial	Glaciomarine	0.5	55		veneer	plain		Mor	very poor	toe
96 17393	8/11/1996	7552778	436690		Glaciomarine		7	242		thickness	gentle slope		Mor	poor	
96 17394	8/9/1996	7512072	437603		Glaciofluvial		18	234		blanket			None	rapid	crest
96 17395	8/11/1996	7553987	436546		Glaciomarine		4	210		plain			Mor	imperfect	crest
96 17396	8/11/1996	7555411	436191		Moraine		4	300		veneer			Mor	well	crest
96 17397	8/11/1996	7555411	435159		Fluvial	Glaciomarine	0			plain			Mor	poor	level

Appendix 2a. Site Data

					Surficial Matarial		Ground Cover			Surficial Expression			Humus		
Site ID	Date	Northing	Easting	Elevation	Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3	Order	Drainage	Mesoslope
96 17398	8/12/1996	7557567	431949		Glaciomarine		3	290		plain			Mor	moderately well	middle
96 17399	8/12/1996	7557407	432215		Moraine		16	265		thickness			Mor	well	lower
96 17400	8/11/1996	7524041	435088		Glaciomarine		2.5	154		plain			Mor	imperfect	level
96 17401	8/12/1996	7530092	433277		Glaciofluvial		0	0		blanket			Mor	rapid	crest
96 17402	8/12/1996	7530448	433347		Glaciomarine		2.5	72		plain			Mor	imperfect	lower
96 17403	8/12/1996	7534205	432512		Glaciomarine		12	82		thickness	gentle slope		Mor	well	middle
96 17404	8/12/1996	7533834	432470		Glaciomarine		11	96		thickness	gentle slope		Mor	well	upper
96 17405	8/12/1996	7535073	432616		Glaciolacustrine		5.5	254					Mor	well	upper
96 17406	8/11/1996	7523409	434746		Glaciomarine		3	58		thickness	gentle slope			imperfect	level
96 17407	8/11/1996	7526003	434795		Glaciomarine		2.5	234		plain			Mor	imperfect	lower
96 17408	8/5/1996	7541801	434096		Glaciomarine		0	0		plain			Mor	very poor	level
96 17409	8/5/1996	7562545	434293		Moraine		31	264		thickness	slope			well	lower
96 17410	8/6/1996	7562767	434071		Moraine		30	82		thickness	slope		Mull	well	middle
96 17411	8/5/1996	7539280	433167		Glaciomarine		2			plain			Mor	moderately well	level
96 17412	8/5/1996	7538814	432830		Glaciomarine		0			plain			Mor	very poor	level
96 17413	8/5/1996	7538788	433147		Glaciomarine		0			plain			Mor	imperfect	level
96 17414	8/5/1996	7538782	432947		Glaciomarine		0			plain	hummocky			poor	level
96 17415	7/30/1996	7559791	434198		Glaciomarine		22	305		thickness	gentle slope		Moder	moderately well	crest
96 17416	7/30/1996	7559925	434909		Glaciofluvial		2	192		plain			None	rapid	crest
96 17417	7/31/1996	7557714	433148		Glaciomarine		1	108		plain				imperfect	level
96 17418	7/31/1996	7557414	432620		Glaciomarine		5	350		gentle slope			Mor	moderately well	middle
96 17420	7/30/1996	7558840	433306		Glaciomarine		0	0		plain			Mor	poor	level
96 17421	7/31/1996	7558624	435256		Glaciomarine		4	59		plain			Moder	imperfect	middle
96 17423	8/3/1996	7536630	433373		Glaciomarine		0	0					Mor	imperfect	level
96 17424	8/3/1996	7535004	433137		Glaciomarine		1.5	78		plain			Mor	imperfect	level
96 17425	7/31/1996	7559147	434494		Glaciofluvial		20	244		thickness	gentle slope		Mor	well	upper
96 17426	8/1/1996	7504739	443183		Moraine		3			thickness			Mor	imperfect	level
96 17427	7/28/1996	7561101	434434		Fluvial	Glaciomarine	0			plain	veneer		None	well	level
96 17428	7/28/1996	7560763	434529		Fluvial	Glaciomarine	0	0		veneer	plain		Mor	imperfect	level
96 17429	7/29/1996	7560156	433120		Glaciomarine	Weathered Bedrock	4	138		veneer			Mor	moderately well	depression
96 4743	7/30/1996	7559011	433550		Moraine		3	207		plain			Mor	well	upper
96 4751	7/29/1996	7559867	434019		Glaciomarine		8	355		plain	gentle slope		Mor	imperfect	middle
96 4771	7/29/1996	7559985	433937		Glaciomarine		8	120		thickness	gentle slope		Mor	poor	lower
96 4772	7/30/1996	7559034	433457		Glaciomarine		16	192		plain	gentle slope		Mor	v	crest
96 4773	7/30/1996	7558852	433266		Glaciomarine		0	167					Mor	imperfect	level
96 4776	8/2/1996	7546692	436561		Glaciomarine		2	330		plain			Mor	imperfect	level
96 4780	8/13/1996	7518210	437173		Glaciomarine		6	80		plain	gentle slope		Mor	moderately well	middle
96 4781	8/13/1996	7516879	436943		Glaciomarine		4	228		plain	gentle slope		Mor	poor	lower
96 4782	8/13/1996	7516862	437134		Moraine		6	255		blanket	gentle slope		None	rapid	upper
96 4787	8/13/1996	7532509	431968		Glaciomarine		8.5	264		veneer	gentle slope		Mor	well	middle
96 4788	8/13/1996	7563372	431981		Glaciomarine		3.5	24		plain			None	rapid	toe
96 4789	8/13/1996	7563334	430047		Glaciomarine		0	0		plain			None	moderately well	level
96 4793	8/9/1996	7546366	435951		Glaciomarine		4	320		blanket	plain	gentle slope	Mor	imperfect	crest
96 4796	8/10/1996	7550825	437203		Glaciofluvial		6	220		blanket			None	rapid	lower
96 4798	8/10/1996	7550058	437447		Glaciomarine		0			blanket	plain			poor	level
96 4799	8/10/1996	7550980	436550		Fluvial	Glaciomarine	0			plain			Mor	moderately well	level
96 4801	8/10/1996	7551207	436599		Glaciofluvial		5	344		thickness			None	rapid	crest
96 4802	8/8/1996	7501419	442444		Moraine		0			blanket			Mull	well	

Appendix 2a. Site Data

					Surficial Matarial		Ground Cover			Surficial Expression			Humus		
Site ID	Date	Northing	Easting	Elevation	Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3	Order	Drainage	Mesoslope
96 4808	8/8/1996	7502471	443125		Glaciomarine		4	263		plain			Mor	imperfect	toe
96 6607	8/6/1996	7502355	443161		Moraine		4	254		plain	gentle slope		Mor	imperfect	middle
96 6608	8/9/1996	7504316	443097		Glaciomarine		0			blanket	plain		Mor	poor	level
96 6706	8/8/1996	7502360	443436		Moraine		5	237		veneer			None	moderately well	middle
96 6707	8/8/1996	7501561	443129		Moraine		17	245		blanket	gentle slope			well	upper
96 6709	8/12/1996	7558647	432114		Glaciomarine		0	7		plain			Mor	imperfect	level
96 6710	8/12/1996	7559277	432471		Moraine		7			veneer			Mor	rapid	crest
96 6711	8/13/1996	7563775	430383		Glaciomarine		1	118		plain			Mor	poor	level
96 6712	8/12/1996	7565031	431117		Glaciomarine		4	20		plain			Mor	poor	middle
D001	8/14/2010	7553578	433669	67	Glaciomarine		3	180	100	undulating			Mull	moderately well	
D002	8/14/2010	7553305	433492	44	Glaciomarine		3	215	99	undulating			Mor	imperfect	
D003	8/15/2010	7546977	433336	51	Moraine		9	270	100	blanket			Mor	imperfect	
D004	8/15/2010	7547382	432972	48	Glaciolacustrine			-	99				Mor	poor	
D005	8/15/2010	7547427	432899	54	Moraine		20	120	45	veneer			Mor	rapid	
D006	8/15/2010	7547704	433211	60	Moraine		5	270		thickness	blanket		Mor	moderately well	
D007	8/15/2010	7548125	432919	53	Moraine		2	260	99	blanket			Mor	poor	
D008	8/15/2010	7548660	433060	69	Moraine		2	-		blanket	thickness		Mor	well	
D009	8/15/2010	7548585	432591	19	Glaciolacustrine		1	-		plain			Mor	poor	
D010	8/15/2010	7548235	432471	42	Moraine		3	160	80	thickness			Mor	rapid	
D011	8/15/2010	7547796	432284	32	Glaciolacustrine		3	180	99				Mor	poor	
D012	8/16/2010	7539768	435015	68	Moraine		10	360	92	thickness			Mor	rapid	
D013	8/16/2010	7539903	435207	58	Glaciolacustrine		1	-					Mor	poor	
D014	8/16/2010	7540346	435779	75	Moraine		10	316		veneer			Mor	very rapid	
D015	8/16/2010	7540580	435918	63	Glaciolacustrine		0	-	99				Mor	poor	
D016	8/16/2010	7540759	436028	82	Moraine		10	120	98	thickness			Mor	well	
D017	8/16/2010	7541383	436139	55	Glaciolacustrine	Organic	0	-	90	veneer	blanket		Mor	very poor	level
D018	8/16/2010	7541992	435993	54	Glaciolacustrine		2	-	99	plain			Mor	poor	level
D019	8/16/2010	7542173	435844	62	Glaciolacustrine		10	140	100	gentle slope			Mor		
D020	8/16/2010	7542445	435631	79	Moraine		10	110	50	veneer			Mull	rapid	crest
D021	8/16/2010	7543060	436121	50	Glaciolacustrine		3	-		plain			Mor	moderately well	level
D022	8/16/2010	7543053	436364	59	Moraine		5	240	96	thickness			Mor	well	upper
D023	8/17/2010	7543950	431418	54	Moraine		5	-	25	veneer			Mull	very rapid	crest
D024	8/17/2010	7543713	431617	47	Glaciolacustrine		1	-	100	plain			Mor	imperfect	level
D025	8/17/2010	7543493	431797	45	Lacustrine		1	-	98	plain			Mor	imperfect	level
D026	8/17/2010				Moraine				0	thickness			Mull	very rapid	crest
D027	8/17/2010	7543266	432280	11	Fluvial	Glaciomarine	10	70	90	gentle slope			Mor	poor	toe
D028	8/17/2010	7543000	432157	28	Glaciolacustrine		10	40	100	blanket			Mull	moderately well	middle
D029	8/17/2010	7542768	432032	50	Moraine		15	290	98	thickness			Mull	imperfect	middle
D030	8/17/2010	7542518	432030	50	Glaciolacustrine		0	-	99	plain			Mull	poor	level
D031	8/17/2010	7542187	432430	47	Glaciolacustrine		5	80	98	plain			Mull	imperfect	middle
D032	8/17/2010	7542115	432709	9	Fluvial		5	140	95	blanket			Mor	poor	toe
D033	8/19/2010	7532162	438933	84	Glaciolacustrine		1	-	99	plain			Mor	imperfect	level
D034	8/19/2010	7531965	438812	96	Moraine		10	340	30	veneer			Mor	very rapid	crest
D035	8/19/2010	7531427	438414	82	Glaciolacustrine		0	-	99	plain			Mor	poor	level
D036	8/19/2010	7531221	438361	93	Moraine		10	20	99	thickness			Mor	well	upper
D037	8/19/2010	7531031	438235	83	Glaciolacustrine		5	320	99	plain			Mull	poor	level
D038	8/19/2010	7530727	438196	88	Moraine		10	316	98	blanket			Mor	well	middle
D039	8/19/2010	7530438	438041	97	Moraine		10	-	96	undulating			Mor	rapid	crest

Appendix 2a. Site Data

					Surficial Matarial		Ground Cover			Surficial Expression			Humus		
Site ID	Date	Northing	Easting	Elevation	Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3	Order	Drainage	Mesoslope
D040	8/19/2010	7529942	438143	115	Bedrock		5	-	20	undulating			Mor	very rapid	crest
D041	8/19/2010	7529543	438384	99	Moraine		1	-	99	plain			Mull	poor	level
D042	8/19/2010	7529300	438752	100	Glaciofluvial		3	-	40	plain			None	rapid	level
D043	8/19/2010	7528747	438876	78	Glaciomarine		3	-		undulating			Mull	well	
D044		7528680	438986	89	Glaciolacustrine		0	-	100	plain			Mor	poor	level
D045	8/20/2010	7556183	429353	48	Moraine		3	200	99	blanket			Mull	imperfect	level
D046	8/20/2010	7556138	429748	38	Colluvial		60	50	60	veneer			Mull	rapid	upper
D047	8/20/2010	7556269	430074	20	Glaciolacustrine		2	-	99	plain			Mull	poor	level
D048	8/20/2010	7556611	430304	14	Glaciolacustrine		0	-		plain			Mor	imperfect	level
D049	8/20/2010	7557321	430856	19	Glaciolacustrine		3	250	99	blanket			Mor	moderately well	upper
D050	8/21/2010	7528679	435378	82	Glaciolacustrine		7	50	99	plain			Mor	imperfect	level
D051	8/21/2010	7528476	435550	84	Moraine		3	70	70	undulating			Mor	rapid	middle
D052	8/21/2010	7528231	435710	77	Glaciolacustrine		2	-	99	plain			Mor	imperfect	level
D053	8/21/2010	7527977	435625	91	Moraine		0	-	15	plain			Mull	rapid	crest
D054	8/21/2010	7527892	435410	83	Organic		0	-	95	plain			Mor	poor	level
D055	8/21/2010	7534463	436373	78	Organic		5	-	60	thickness			Mull	rapid	crest
D056	8/21/2010	7534544	436530	60	Glaciolacustrine		0	-	99	plain			Mor	poor	level
D057	8/21/2010	7534702	436768	70	Glaciolacustrine		10	190	99	undulating			Mor	poor	middle
D058	8/21/2010	7534736	437104	75	Glaciolacustrine		1	-	99	plain			Mor	poor	
D059	8/22/2010	7494897	445959	136	Moraine		5	236	95	undulating			Mull	rapid	middle
D060	8/22/2010	7495148	445545	118	Colluvial		30	260	98	k			Mull	moderately well	middle
D061	8/22/2010	7495180	445242	93	Glaciolacustrine		10	250		blanket			Mull	imperfect	toe
D062	8/23/2010	7500407	445021	125	Moraine		5	-	80	undulating			Mor	well	middle
D063	8/23/2010	7500331	444873	125	Weathered bedrock		5	-	15	veneer			Mull	very rapid	crest
D064	8/23/2010	7500198	444237	111	Moraine		0	-	98	plain			Mor	rapid	level
D065	8/23/2010	7500774	443575	95	Colluvial		10	250	70	blanket			Mull	moderately well	middle
D066	8/23/2010	7500640	443251	88	Colluvial		10	50	100	blanket			Mor	moderately well	lower
D067	8/23/2010	7500507	442872	113	Glaciolacustrine		10	180	99	blanket			Mor	moderately well	toe
D068	8/23/2010	7500507	442470	113	Moraine		5	-	98	blanket			Mor	imperfect	middle
D069	8/23/2010	7500367	441878	85	Moraine		5	270	99	blanket			Mor	moderately well	middle
D070	8/23/2010	7500063	441289	72	Moraine		2	270		blanket			Mull	moderately well	lower
D071	8/24/2010	7505185	443663	81	Moraine		5	270	98	blanket			Mor	moderately well	middle
D072	8/24/2010	7505467	443686	68			3	-	85	plain			Mor	moderately well	level
D073	8/24/2010	7506162	443756	88	Weathered bedrock		10	-	60	veneer			Mull	very rapid	crest
D074	8/24/2010	7506660	444891	104	Moraine		10	270	70	gentle slope			Mull	rapid	middle
D075	8/24/2010	7506676	444448	102	Moraine		3	150	98	blanket			Mor	moderately well	lower
D076	8/24/2010	7507620	443985	84	Glaciofluvial		5	340	99	plain			Mor	moderately well	lower
D077	8/24/2010	7507831	443891	81	Glaciolacustrine		2	-	99	plain			Mor	imperfect	lower
D078	8/25/2010	7510516	443627	101	Glaciofluvial		18	310	30	undulating			None	rapid	crest
D079	8/25/2010	7511068	443938	82	Glaciolacustrine		2	-	98	plain			Mor	poor	level
D080	8/25/2010	7511146	443514	86	Glaciolacustrine		2	-	99	plain			Mor	poor	level
D081	8/25/2010	7511148	442790	88	Glaciolacustrine		2	-	100	plain			Mor	moderately well	level
D082	8/25/2010	7511352	442400	99	Moraine		7	10	95	blanket			Mull	well	upper
D083	8/25/2010	7512071	442215	87	Glaciolacustrine		4	36		plain			Mor	poor	level
D084	8/25/2010	7512149	442020	93	Moraine		3	-		blanket			Mor	well	middle
D085	8/25/2010	7512282	441343	86	Glaciolacustrine		5	240		plain			Mor	imperfect	middle
D086	8/25/2010	7512126	440881	94	Eolian		5	270	60	veneer			Mull	very rapid	crest
D087	8/25/2010	7512135	440699	95	Glaciolacustrine		2	-	99	plain			Mor	imperfect	level

Appendix 2a. Site Data

Site ID	Date	Northing	Easting	Elevation	Surficial Matarial		Ground Cover			Surficial Expression			Humus		
					Primary	Secondary	Slope (%)	Aspect	(%)	1	2	3	Order	Drainage	Mesoslope
D088	8/25/2010	7512115	440559	103	Moraine		5	140	0	thickness			Mor	rapid	upper
D089	8/26/2010	7521197	439153	105		Organic	6	160	90	plain			Mor	very rapid	upper
D090	8/26/2010	7521045	439184	100	Glaciolacustrine		2	-	98	plain			Mor	poor	level
D091	8/26/2010	7520494	438937	104	Glaciolacustrine		3	250		plain			Mull	poor	level
D092	8/26/2010	7520069	438700	98	Organic	Lacustrine	2	-	99	plain			Mor	poor	level
D093	8/26/2010	7519798	438438	100	Eolian		2	-	75	plain			Mull	rapid	crest
D094	8/26/2010	7519705	438390	94	Lacustrine		2	-	99	plain			Mor	poor	level
D095	8/26/2010	7519182	438451	105	Eolian		3	-	5	plain			Mull	very rapid	crest
D096	8/26/2010	7518693	438453	99	Glaciofluvial		2	-		plain			Mull	moderately well	level
D097	8/26/2010	7518237	438110	101	Glaciomarine		20	200	60	ridge			None	rapid	upper
D098	8/26/2010	7518000	438382	102	Moraine		3	-	60	thickness			Mull	rapid	crest
D099	8/26/2010	7517814	438580	102	Lacustrine		3	-	99	plain			Mor	poor	level
D100	8/26/2010	7517384	438867	105	Glaciolacustrine		10	360		blanket			Mor	imperfect	middle
D101		7517496	438947	97	Organic		0	-	95	plain			Mor	very poor	level
D102	8/27/2010	7524930	437940	93	Moraine		5	10	99	blanket			Mor	moderately well	crest
D103	8/27/2010	7524875	437813	90	Glaciomarine		6	240	99	blanket			Mor	imperfect	
D104	8/27/2010	7524593	437654	79	Lacustrine		2	-	99	blanket			Mor	very poor	
D105	8/27/2010	7524024	437567	109	Weathered bedrock		2	-	2	thickness			Mull	very rapid	crest
D106	8/27/2010	7523579	438028	97	Moraine		5	-	70	undulating			Mor	well	crest
D107	8/27/2010	7523270	438343	92	Glaciomarine		3	190	99	plain			Mor	poor	middle
D108	8/27/2010	7522911	438371	107	Eolian	Weathered Bedrock	7	180	60	thickness			Mull	very rapid	crest
D109	8/27/2010	7522631	438474	91	Organic		0	-	100	hummocky			Mull	moderately well	
D110	8/27/2010	7522493	438577	96	Glaciomarine		1	-	99	plain			Mor	poor	level
D111	8/27/2010	7522219	439381	84	Organic		2	-	95	blanket			Mor	poor	
D112	8/27/2010	7522261	439582	95	Moraine		5	260	100	blanket			Mor	moderately well	middle
D113	8/28/2010	7513228	444265	86	Glaciomarine		7	340	98	blanket			Mor	poor	lower
D114	8/28/2010	7513021	444040	100	Moraine		5	350	99	blanket			Mor	well	upper
D115	8/28/2010	7512800	443803	90	Glaciomarine		2	-		plain			Mor	poor	level
D116	8/28/2010	7512327	444233	108	Moraine		10	170	98	blanket			Mor	well	upper
D117	8/28/2010	7511860	444289	101	Glaciomarine		3	-		plain			Mor	imperfect	middle
D118	8/28/2010	7511149	444473	103	Moraine		10	310	95	blanket			Mor	well	middle
D119	8/28/2010	7510544	444785	91	Moraine		12	330	97	blanket			Mor	well	lower
D120	8/28/2010	7510157	444973	97	Moraine		5	75	95	blanket			Mor	imperfect	upper
D121	8/28/2010	7510237	445760	92	Moraine		12	30		blanket			Mull	moderately well	
D122	8/28/2010	7510305	446280	78	Fluvial		2	-		plain			Mor	poor	toe
D123	8/28/2010	7510365	446560	88	Lacustrine		5	60	100	plain			Mull	moderately well	
D124	8/28/2010	7510003	446345	100	Moraine		5	80	90	thickness			Mull	rapid	upper
D125	8/29/2010	7495476	446527	132	Weathered bedrock	Moraine	2	-	60	thickness			Mor	very rapid	level
D126	8/29/2010	7495678	446619	131	Moraine	Bedrock	2	-	98	plain			Mor	imperfect	level
D127	8/29/2010	7495957	446406	136	Bedrock		2	-	5	thickness			None	very rapid	
D128	8/29/2010	7496184	445880	127	Weathered bedrock	Eolian	3	-		plain			Mull	very rapid	crest
D129	8/29/2010	7496602	445620	121	Glaciolacustrine		2	-	100	plain			Mor	poor	lower
D130	8/29/2010	7496448	445145	126	Weathered bedrock	Eolian	7	130	95	veneer			Mull	very rapid	
D131	8/29/2010	7497142	444882	108	Organic		1	-	100	plain			Mor	very poor	level
D132	8/29/2010	7497620	444763	101	Moraine		10	50	98	blanket			Mull	moderately well	middle
D133	8/29/2010	7497952	444403	102	Glaciomarine		3	-	100	plain			Mor	poor	level

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
01	Of	20	13		-	-	-	-	7.5YR 2.5/1	0	0	0	0	0	-	-	-	abundant	medium	-		GL.SC
01	Om	13	8		-	-	-	-	7.5YR 3/2	0	0	0	0	0	-	-	-	abundant	medium	-		GL.SC
01	Oh	8	0		-	-	-	-	7.5YR 2.5/2	0	0	0	0	0	-	-	-	abundant	medium	-		GL.SC
01	Cg1	0	10	sic	weak	-	massive	wet	5Y 6/1	0	0	0	0	0	-	-	-	few	-	-		GL.SC
01	Cg2	10+		sic	strong	-	massive	wet	5Y 6/1	0	0	0	0	0	-	-	-	few	-	-		GL.SC
02	Ah	0	5	sl	moderate	coarse	single grain	moist	10YR 2/2						round	-	-	few	medium	-		GL.DYB
02	C	5	10	sl	moderate	coarse	single grain	moist	7.5YR 3/2	10	20	20	0	50	round	few	-	few	fine	-		GL.DYB
02	Ahb	5	15	cl	moderate	coarse	single grain	moist	10YR 2/2	10	20	20	0	50	round	-	-	few	fine	-		GL.DYB
02	Bm	15	33	s	weak	coarse	single grain	moist	7.5YR 2.5/2	10	20	20	0	50	angular	few	-	few	fine	-		GL.DYB
02	Cgj	33+		s	weak	coarse	single grain	moist	5Y 6/2	10	20	20	0	50	angular	-	-	-	-	-		GL.DYB
04	Ah	0	4		weak	fine	granular	moist	10YR 2/1							-	-	abundant	medium	-		GL.TC
04	Bmgj	4	11	cl	moderate	fine	subangular blocky	moist	2.5Y 3/3	0	0	10	0	10	round	few	medium	plentiful	medium	-		GL.TC
04	Bmgj	11	15	cl	strong	medium	platy	moist	2.5Y 3/2							common	coarse	few	fine	-		GL.TC
04	BC	15	33	sic	strong	medium	platy	wet	5GY 3/1							-	-	few	fine	-		GL.TC
04	C	33	36	sic	moderate	medium	massive	wet	2.5Y 3/1	0	0	10	0	10	round	-	-	-	-	-		GL.TC
04	Cz	36+			-	-	-	-	-							-	-	-	-	-	36	GL.TC
05	Om	25	0		-	-	-	-	10YR 2/2							-	-	abundant	coarse	-		TME.OC
05	Cg	0	3	sicl	weak	very fine	massive	moist	10YR 3/1							-	-	few	fine	-		TME.OC
05	Cz	3+			-	-	-	-	-							-	-	-	-	-	28	TME.OC
07	Ah	0	6	sil	moderate	fine	granular	moist	10YR 2/1	0	0	0	40	40	round	-	-	abundant	coarse	-		O.DYB
07	Bm	6	16	sl	weak	medium	subangular blocky	moist	10YR 3/4	0	0	60	0	60	angular	-	-	abundant	coarse	-		O.DYB
07	Ahb	16	37	sl	moderate	medium	subangular blocky	moist	10YR 2/1	0	0	60	0	60	angular	-	-	abundant	medium	-		O.DYB
07	C	37	45	sl	moderate	medium	subangular blocky	moist	10YR 3/4	0	0	60	0	60	angular	-	-	plentiful	fine	-		O.DYB
08	Ah	0	12		moderate	medium	granular	moist	10YR 2/1							-	-	abundant	coarse	-		R.G
08	Cg	12	32	sic	strong	coarse	platy	wet	5Y 4/3							few	fine	few	fine	-		R.G
08	Cz	32+			-	-	-	wet	-							-	-	-	-	-	32	R.G
09	Of	20	0		-	-	-	-	7.5YR 3/1							-	-	abundant	coarse	-		FL.OC
09	Cz	0+			-	-	-	wet	-							-	-	-	-	-		FL.OC
10	Ah	0	9	sl	strong	medium	granular	moist	7.5YR 3/1	0	0	30	40	70	round	-	-	plentiful	coarse	-		O.DYB
10	Bm	9	17	sil	strong	medium	subangular blocky	moist	2.5YR 5/4	0	20	40	0	60	angular	many	coarse	few	coarse	-	19	O.DYB
10	R	17+			-	-	-	-	-							-	-	-	-	-		O.DYB
11	LFH	7	0		weak	fine	massive	moist	10YR 3/2	0	0	10	10	20	round	-	-	abundant	medium	-		GL.TC
11	Ah	0	6	sil	weak	fine	massive	moist	10YR 2/1	0	0	10	10	20	round	-	-	abundant	medium	-		GL.TC
11	Bm	6	12	sl	moderate	medium	subangular blocky	moist	7.5YR 5/6	0	20	10	20	50	round	many	coarse	abundant	medium	-		GL.TC
11	Bmy	12	24	sl	moderate	medium	subangular blocky	moist	7.5YR 2/2	0	20	10	0	30	round	common	medium	-	-	-		GL.TC
11	Cg	24	28	sl	moderate	fine	massive	moist	7.5YR 5/5							-	-	-	-	-		GL.TC
11	Ahy	28	30	l	moderate	medium	subangular blocky	moist	10YR 2/1	20	10	0	0	30	round	-	-	-	-	-		GL.TC
11	Cgj	30+		sl	moderate	fine	massive	moist	7.5YR 5/2							-	-	-	-	-		GL.TC
12	Of	10	4		-	-	-	-	5YR 3/1							-	-	abundant	medium	-		GL.SC
12	Oh	4	0		-	-	-	-	5YR 2.5/2							-	-	abundant	medium	-		GL.SC
12	Bmj	0	22	sl	strong	medium	angular blocky	wet	5Y 5/6	20	20	0	0	40	round	common	coarse	plentiful	fine	-		GL.SC
12	Cg	22	41	sicl	moderate	medium	pr	wet	10YR 4/1	20	20	0	0	40	round	few	medium	-	medium	-		GL.SC
12	Cz	41+			-	-	-	-	-							-	-	-	-	-	41	GL.SC
13	LFH	6	0		weak	coarse	single grain	moist	10YR 2/2	0	0	0	20	20	round	-	-	plentiful	-	-		O.DYB
13	Bm	0	12	sl	weak	medium	subangular blocky	moist	10YR 3/6	10	10	10	0	30	round	common	medium	few	-	-		O.DYB
13	C	12	55	sl	weak	medium	subangular blocky	moist	10YR 5/4	10	10	10	0	30	round	few	fine	few	-	-		O.DYB
14	Ah	4	0		-	-	-	-	10YR 2/1							-	-	plentiful	medium	-		GL.TC
14	Bgy	0	11	sicl	strong	vc	angular blocky	moist	10YR 6/1							-	fine	few	fine	-		GL.TC
14	Cg	11	42	cl	weak	medium	pr	moist	10YR 4/1							-	coarse	-	-	-		GL.TC
14	Cz	42			-	-	-	wet	-							-	-	-	-	-	41	GL.TC
15	Ah	0	7	sicl	moderate	medium	subangular blocky	moist		0	20	20	0	40	Both	-	-	plentiful	medium	-		GL.TC
15	Bm	7	13	sl	moderate	medium	subangular blocky	moist		0	20	20	0	40	Both	few	fine	plentiful	fine	-		GL.TC
15	Ahy	13	17	sicl	moderate	medium	subangular blocky	moist		0	20	20	0	40	Both	-	-	plentiful	fine	-		GL.TC
15	Cg	17	43	sl	moderate	medium	subangular blocky	moist		0	20	20	0	40	Both	few	fine	few	fine	-		GL.TC
16	LFH	11	0		weak	-	massive	moist	10YR 2/1							-	-	plentiful	medium	-		GL.TC
16	Cgy	0	21	cl	strong	coarse	f	moist	5BG 6/1	0	10	0	0	10	-	-	-	few	fine	-		GL.TC
16	Bgy	21	59	sil	strong	coarse	angular blocky	moist	10YR 2/1	0	10	0	0	10	-	-	-	few	fine	-		GL.TC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
16	Cz	37+			strong	coarse	massive	moist								-	-	-	-	-		GL.TC
17	Of	18	8		-	-	-	-								-	-	abundant	coarse	-		TME.OC
17	Om	8	0		-	-	-	-								-	-	abundant	coarse	-		TME.OC
17	Cz	0+			-	-	-	-								-	-	-	-	-		TME.OC
18	LF	5	0		-	-	-	moist	10YR 2/1							-	-	-	coarse	-		GL.SC
18	Bm	0	18	cl	strong	fine	platy	moist	2.5Y 6/2							many	-	-	medium	-		GL.SC
18	Cg	18	40	sic	strong	fine	platy	moist	2.5Y 5/2							few	-	-	fine	-		GL.SC
18	Cz	40+			-	-	-	-								-	-	-	-	-		GL.SC
19	Ah	0	30		-	-	-	-	10YR 2/1	0	10	20	40	70		-	-	-	-	-		O.DYB
19	Bm	30	40		-	-	-	-	10YR 2/1	0	10	20	40	70		-	-	-	-	-		O.DYB
19	R	40+			-	-	-	-								-	-	-	-	-		O.DYB
20	LFH	7	0		-	-	-	moist	10YR 4/5	0	0	0	40	40	round	-	-	abundant	medium	-		GL.SC
20	Ah	0	16	sil	moderate	medium	angular blocky	moist	10YR 2/5	10	10	20	40	70	round	-	-	plentiful	fine	-		GL.SC
20	Cg	16	40	sicl	moderate	medium	angular blocky	moist	10YR 5/1	10	10	40	0	60	round	few	fine	few	fine	-		GL.SC
20	Cz	44+			-	-	-	-								-	-	-	-	-		GL.SC
21	LFH	2	0		-	-	-	-	10YR 4/3							-	-	abundant	-	-		GL.SC
21	Ah	0	4	sicl	weak	medium	subangular blocky	moist	10YR 2/1							-	-	abundant	-	-		GL.SC
21	Bmg	4	28	cl	strong	medium	angular blocky	moist	2.5Y 5/2							common	medium	plentiful	-	-		GL.SC
21	Cg	28	52	cl	strong	medium	platy	-	10YR 5/2							few	medium	-	-	-		GL.SC
21	Cz	52+			-	-	-	-								-	-	-	-	-	52	GL.SC
22	LFH	4	0		-	-	-	-	10YR 2/1	0	0	0	10	10	round	-	-	plentiful	medium	-		GL.SC
22	Ah	0	8	sil	weak	medium	subangular blocky	moist	10YR2/1	0	10	0	10	20	round	-	-	plentiful	medium	-		GL.SC
22	Bm	8	19	sl	strong	medium	angular blocky	moist	2.5YR 5/4	0	10	0	0	10	round	common	coarse	few	fine	-		GL.SC
22	Cg	19	68	sicl	strong	medium	platy	wet	10Y 3/2	0	10	0	0	10	round	-	-	-	-	-		GL.SC
22	Cz	68+			-	-	-	-								-	-	-	-	-	68	GL.SC
23	LFH	2	0		-	-	-	moist	5YR 2.5/2							few	-	abundant	coarse	-		GL.SC
23	Bg	0	23	sicl	strong	coarse	angular blocky	wet	2.5Y 4/2							-	-	plentiful	coarse	-		GL.SC
23	Cg	23	43	cl	strong	coarse	platy	wet	2.5Y 4/1							common	medium	few	medium	-		GL.SC
23	Cz	43	999		-	-	-	-								-	-	-	-	-	43	GL.SC
24	LF	6	0		-	-	-	moist	5YR 2.5/2	0	20	10	0	30	round	-	-	abundant	coarse	-		O.HR
24	Ah	0	16	scl	weak	medium	angular blocky	moist	2.5Y 2.5/1	0	20	10	0	30	round	-	-	abundant	coarse	-		O.HR
24	C	16	38	scl	weak	medium	angular blocky	moist	2.5Y 3/3	0	20	10	0	30	round	-	-	plentiful	coarse	-		O.HR
26	LFH	3	0		-	-	-	moist	5YR 2.5/2							-	-	abundant	coarse	-		BR.SC
26	Ah	0	4	sil	strong	medium	angular blocky	wet	2.5Y 2.5/1							-	-	abundant	medium	-		BR.SC
26	Bm	4	30	sicl	strong	coarse	pr	wet	2.5Y 5/4							many	coarse	few	fine	-		BR.SC
26	Cz	30+			-	-	-	wet								-	-	-	-	-	30	BR.SC
27	Of	6	0		-	-	-	wet								-	-	abundant	medium	-		GL.TC
27	Ah	0	9		-	-	-	wet	10YR 2/2							-	-	abundant	medium	-		GL.TC
27	Bmy	9	17	sic	weak	-	cl	wet	2.5Y 4/4							common	coarse	few	fine	-		GL.TC
27	Cgy	17	30	sil	weak	coarse	cl	wet	5Y 2.5/1							-	-	-	-	-		GL.TC
27	Cz	35+			-	-	-	-								-	-	-	-	-	35	GL.TC
28	Of	12	0		-	-	-	-								-	-	abundant	coarse	-		TME.OC
28	Omz	0+			-	-	-	-								-	-	few	-	-	12	TME.OC
29	Of	9	0		-	-	-	moist	10YR 2/1							-	-	abundant	coarse	-		GL.TC
29	Bg	0	8	sic	strong	fine	angular blocky	moist	2.5Y 4/3							-	fine	abundant	coarse	-		GL.TC
29	Cgy	8	22	sic	moderate	coarse	subangular blocky	moist	2.5Y 4/3							few	-	abundant	medium	-		GL.TC
29	Ahy	22	44	sicl	weak	fine	angular blocky	wet	2.5Y 3/2							-	-	plentiful	medium	-		GL.TC
29	Cz	44+			-	-	-	-								-	-	-	-	-		GL.TC
30	LF	6	0		-	-	-	-	10YR 2/2	0	0	0	10	10		-	-	-	-	-		R.SC
30	Bm	0	11	ls	weak	fine	massive	moist	10YR 5/4	0	20	10	10	40		common	coarse	-	-	-		R.SC
30	BCgj	11	28	ls	weak	fine	massive	moist	2.5Y 5/2	10	20	10	0	40		few	medium	-	-	-		R.SC
30	C	28	78	s	weak	fine	massive	moist	2.5Y 5/4	10	20	10	0	40		-	-	-	-	-		R.SC
30	Cz	78+			-	-	-	-								-	-	-	-	-	84	R.SC
D001	Ah	0	4	sil	weak	fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D001	Cg	4	16	sil	moderate	coarse	subangular blocky	moist	4/10Y	0	0	0	0	0	-	common	medium	few	fine	-		GL.TC
D001	Bgy	16	25	sil	moderate	coarse	subangular blocky	wet	5Y 3/2	0	0	0	0	0	-	few	fine	plentiful	fine	-		GL.TC
D001	Ahy	25	30		weak	very fine	granular	wet	10YR 2/1	0	0	0	0	0	-	-	-	-	-	Permafrost	30	GL.TC

Appendix 2b. Soils Data

		Depth		Texture	Structure			Aspect		Colour		Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
Site ID	Horizon Classification	Top (cm)	Bottom (cm)		Grade	Size	Kind					Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D001	Cz	30+		sil	-	-	-	-		0	0	0	0	0	-	-	-	-	-	-	-		GL.TC	
D002	LF	25	20		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		HR.TC		
D002	Of	20	0		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		HR.TC		
D002	Cgy	0	30		weak	very fine	subangular blocky	wet	4/10Y	0	0	0	0	0	-	few	medium	few	fine	-		HR.TC		
D002	Ahy	30	35	sil	weak	very fine	granular	wet	10YR 2/1	0	0	0	0	0	-	-	-	few	fine	-		HR.TC		
D002	Cz	35+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	Permafrost	35	HR.TC		
D003	LFH	3	0		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.TC		
D003	Bm	0	10		cl	moderate	fine	granular	moist	10YR 3/4	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.TC	
D003	Bg	10	25	cl	moderate	fine	subangular blocky	moist	2.5Y 3/3	0	0	0	0	0	-	few	fine	-	-	-		BRD.TC		
D003	BCgy	25	35		moderate	medium	subangular blocky	moist	2.5Y 3/2	0	0	0	0	0	-	-	-	-	-	Permafrost	25	BRD.TC		
D003	Cz	35+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	Permafrost		BRD.TC		
D004	Of	22	0		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		HR.TC		
D004	Cgj	0	18	sic	moderate	medium	subangular blocky	wet	5Y 4/1	0	0	0	0	0	-	-	-	few	fine	-		HR.TC		
D004	Ahy	18	22		weak	fine	granular	wet	2.5Y 3.3	0	0	0	0	0	-	-	-	-	-	-		HR.TC		
D004	Cz	22+	100		-	-	-	-		0	0	0	0	0	-	-	-	-	-	Permafrost	22	HR.TC		
D005	LFH	18	0		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		O.HR		
D005	Ah	0	10	sl	weak	fine	granular	moist	10YR 2/1	5	20	25	0	50	angular	-	-	plentiful	fine	-		O.HR		
D005	C	10	30		-	-	single grain	moist	10YR 3/4	10	30	30	10	80	angular	-	-	few	fine	-		O.HR		
D005	R	30+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	L	30	O.HR		
D006	LF	2	0		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		BRD.TC		
D006	Bm	0	20	l	moderate	fine	subangular blocky	moist	10YR 5/3	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.TC		
D006	Ahby	20	30		weak	fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	-	few	fine	-		BRD.TC		
D006	Cy	30	47		moderate	medium	subangular blocky	moist	2.5Y 4/1	0	0	0	0	0	-	-	-	few	fine	-		BRD.TC		
D006	Cz	47+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	47	BRD.TC		
D007	LFH	8	0	cl	-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC		
D007	Bg	0	20		-	-	massive	wet	5/10GY	0	0	0	0	0	-	many	coarse	few	fine	-		GL.TC		
D007	Cg	20	40		-	-	massive	wet	4/10 Y	0	5	0	0	5	round	-	-	-	-	-		GL.TC		
D007	Cgy	40	50		-	-	massive	wet	2.5/10 Y	0	5	0	0	5	round	-	-	-	-	-		GL.TC		
D007	Cz	50+		cl	-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	50	GL.TC		
D008	LFH	2	0		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		BRD.TC		
D008	Ahy	0	25		l	weak	fine	granular	moist	10YR 2/1	0	2	0	0	2	round	-	-	plentiful	fine	-		BRD.TC	
D008	Bmy	25	50		sl	weak	fine	subangular blocky	moist	2.5Y 2.5/1	0	2	0	0	2	round	-	-	plentiful	fine	-		BRD.TC	
D008	Cy	50	70	ls	-	-	single grain	moist	2.5Y3/3	3	2	5	0	10	round	-	-	-	-	-		BRD.TC		
D008	Cz	70+			-	-	-	wet		-	-	-	-	-	-	-	-	-	-	Permafrost	70	BRD.TC		
D009	LF	2	0		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		OD.SC		
D009	Bm	0	5		cl	moderate	fine	subangular blocky	wet	10YR 3/2	0	0	0	0	0	-	-	-	abundant	fine	-		O.TC	
D009	Ahby	5	20	sil	weak	fine	granular	wet	10YR 3/4	0	0	0	0	0	-	-	-	abundant	fine	-		O.TC		
D009	Bhgy	20	30		-	-	massive	wet	10Y 3/6	0	0	0	0	0	-	few	fine	plentiful	fine	-		O.TC		
D009	Cy	30	50		sic	-	-	massive	wet	2.5Y 3/3	0	0	0	0	0	-	-	-	few	fine	-		O.TC	
D009	Cz	50+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		O.TC		
D010	LFH	2	0	sl	-	-	-	-		0	0	0	0	0	-	-	-	abundant	medium	-		R.TC		
D010	Bm	0	7		weak	fine	subangular blocky	moist	10YR 4/6	3	2		0	5	round	-	-	plentiful	fine	-		R.TC		
D010	Cy	7	15		weak	fine	subangular blocky	moist	2.5Y 4/4	5	0	0	0	5	round	-	-	plentiful	fine	-		R.TC		
D010	Ahy	15	25		l	weak	fine	granular	moist	10YR 2/1	2	0	0	0	2	round	-	-	abundant	fine	-		R.TC	
D010	Cy2	25	40	ls	weak	medium	subangular blocky	moist	10YR 4/4	5	10	0	0	15	round	-	-	few	fine	-		R.TC		
D010	Cy3	40	70		-	-	single grain	moist	2.5Y 3.3	5	5	0	0	10	round	-	-	-	-	-		R.TC		
D010	R	70+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	L	70	R.TC		
D011	LF	15	13		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		HR.TC		
D011	Of	13	0	cl	-	-	-	-		0	0	0	0	0	-	-	-	few	fine	-		HR.TC		
D011	Cg	0	30		-	-	massive	wet	3/10 GY	0	0	0	0	0	-	few	medium	few	fine	-		HR.TC		
D011	Cz	30+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	30	HR.TC		
D012	LFH	3	0		-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		O.SB		
D012	Ah	0	15	sl	weak	medium	granular	moist	10YR 2/2	5	5	5	0	15	round	-	-	plentiful	fine	-		O.SB		
D012	Bm	15	30		ls	weak	fine	subangular blocky	moist	7.5YR 3/4	20	20	10	0	50	round	-	-	few	fine	-		O.SB	
D012	BC1	30	50		-	-	single grain	moist	10YR 3/6	15	20	20	0	55	round	-	-	few	fine	-		O.SB		
D012	BC2	50	70+		ls	-	-	single grain	moist	10YR 4/4	10	20	20	5	55	round	-	-	-	-	-		O.SB	
D013	LF	18	15		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		HR.TC		

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D013	Of	15	5		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		HR.TC
D013	Om	5	0		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		HR.TC
D013	Cg	0	43	sicl	-	-	massive	wet	3/10Y	0	0	0	0	0	-	-	-	-	-	-		HR.TC
D013	Cz	43+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	43	HR.TC
D014	LF	3	0		-	-	-	-		0	0	0	0	0	-	-	-	few	fine	-		O.DYB
D014	Bm	0	15	ls	-	-	single grain	moist		0	0	0	0	0	-	-	-	-	-	-		O.DYB
D014	R	15+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	L	13	O.DYB
D015	LF	12	10		-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		GL.SC
D015	Of	10	0		-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		GL.SC
D015	Cg1	0	20	sl	-	-	massive	wet	5/5GY	0	0	0	0	0	-	common	medium	few	fine	-		GL.SC
D015	Cg2	20	34	sl	-	-	massive	wet	3/10Y	0	0	0	0	0	-	few	fine	-	-	-		GL.SC
D015	Cz	43+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	43	GL.SC
D016	LFH	3	0		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		O.DYB
D016	Bm	0	25	ls	weak	fine	subangular blocky	moist	10YR 3/4	10	10	5	0	25	round	-	-	plentiful	fine	-		O.DYB
D016	BC	25	45	ls	-	-	single grain	moist	2.5Y 3/3	15	15	10	0	40	round	-	-	few	fine	-		O.DYB
D016	C	45	75		-	-	single grain	moist	2.5Y 3/2	15	15	10	0	40	round	-	-	few	-	-		O.DYB
D017	LF	20	17		-	-	-	-		0	0	0	0	0	-	-	-	plentiful	fine	-		TFI.OC
D017	Of	17	0		-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		TFI.OC
D017	Cy	0	5	sicl	-	-	massive	wet	5Y 3/2	0	0	0	0	0	-	-	-	-	-	-		TFI.OC
D017	Ofy	5	10		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		TFI.OC
D017	Cy	10	15	sicl	-	-	massive	wet	5Y 3/2	0	0	0	0	0	-	-	-	-	-	-		TFI.OC
D017	Ofy	15	20		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		TFI.OC
D017	Cz	20+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	Permafrost	40	TFI.OC
D018	LF	17	15		-	-	-	-		0	0	0	0	0	-	-	-	-	-	-		HR.TC
D018	Of	15	0		-	-	-	-		0	0	0	0	0	-	-	-	abundant	fine	-		HR.TC
D018	Bhy	0	5	sil	weak	medium	subangular blocky	wet	10YR 3/3	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D018	Ofy	5	10		-	-	-	-		0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D018	Cy	0	15	sil	-	-	massive	wet	5Y 4/2	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D018	Cz	15+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	15	HR.TC
D019	LFH	4	0		-	-	-	-		0	0	0	0	0	-	-	-	few	fine	-		GL.TC
D019	Cg1	0	25	sil	moderate	coarse	subangular blocky	moist	5Y 4/2	0	0	0	0	0	-	many	medium	plentiful	fine	-		GL.TC
D019	Cg2	25	40	sil	moderate	medium	subangular blocky	moist	2.5Y 3/2	0	0	0	0	0	-	common	fine	few	fine	-		GL.TC
D019	Cgy	40	60	l	-	-	massive	moist	2.5/N	0	0	0	0	0	-	few	fine	-	-	-		GL.TC
D019	Cz	60+			-	-	-	-		0	0	0	0	0	-	-	-	-	-	Permafrost	60	GL.TC
D020	L	2	0		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		O.SB
D020	Ah	0	30	ls	-	-	single grain	moist	10YR 2/2	25	20	5	0	50	round	-	-	plentiful	fine	-		O.SB
D020	Bm	30	50	ls	-	-	single grain	moist	7.5YR 2.5/3	30	20	10	0	60	round	-	-	few	fine	-		O.SB
D020	R	50+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	L	60	O.SB
D021	LF	1	0		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		R.TC
D021	Cg	0	20	cl	moderate	medium	subangular blocky	moist	2.5Y 4/4	0	0	0	0	0	-	few	fine	plentiful	fine	-		R.TC
D021	Cy	20	45	cl	moderate	medium	subangular blocky	wet	2.5Y 4/2	0	0	0	0	0	-	-	-	few	fine	-		R.TC
D021	Ahy	45	55		moderate	medium	subangular blocky	wet	2.5Y 2.5/1	0	0	0	0	0	-	-	-	-	-	-		R.TC
D021	Cz	55+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	55	R.TC
D022	LF	1	0		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		O.DYB
D022	Bm	0	22	sl	weak	fine	subangular blocky	moist	10YR 3/4	5	10	10	0	25	round	-	-	-	-	-		O.DYB
D022	BC	22	45	ls	weak	fine	subangular blocky	moist	2.5Y 5/4	15	5	5	0	35	round	-	-	few	fine	-		O.DYB
D022	C	45+		ls	-	-	single grain	moist	2.5Y 3/3	10	15	10	0	35	round	-	-	few	fine	-		O.DYB
D023	LF	3	0		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		O.SB
D023	Ah	0	12	ls	-	-	single grain	moist	10YR 2/2	10	50	5	0	65	round	-	-	plentiful	fine	-		O.SB
D023	Bm	12	22	ls	-	-	single grain	moist	10YR 3/3	15	50	15	0	80	round	-	-	few	fine	-		O.SB
D023	R	22+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	L	22	O.SB
D024	LFH	4	0		-	-	-	-		-	-	-	-	-	-	-	-	plentiful	fine	-		GL.SC
D024	Bg	0	30	sicl	moderate	medium	subangular blocky	moist	4/10Y	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.SC
D024	Cg	30	50	sicl	-	-	massive	wet	2.5/10Y	0	0	0	0	0	-	few	fine	-	-	-		GL.SC
D024	Cz	50+			-	-	-	-		-	-	-	-	-	-	-	-	-	-	Permafrost	50	GL.SC
D025	LFH	2	0		-	-	-	-		-	-	-	-	-	-	-	-	abundant	fine	-		GL.SC
D025	Bm	0	6	sicl	moderate	medium	granular	moist	10YR 3/4	0	0	0	0	0	-	-	-	abundant	fine	-		GL.SC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D025	Bg	6	35	sicl	moderate	coarse	subangular blocky	moist	4/5GY	0	0	0	0	0	-	common	coarse	plentiful	coarse	-		GL.SC
D025	Cg	35	58	sicl	-	-	massive	moist	3/10Y	0	0	0	0	0	-	-	-	few	fine	-		GL.SC
D025	Cz	58+			-	-	-	-	-							-	-	-	-	Permafrost	58	GL.SC
D026	LFH	2	0		-	-	-	-	-							-	-	plentiful	fine	-		E.DYB
D026	Ahe	0	3	ls	weak	very fine	subangular blocky	moist	10YR 3/2	5	20	5	0	30	angular	-	-	abundant	fine	-		E.DYB
D026	Bm	3	15	sl	weak	fine	subangular blocky	moist	10YR 3/6	10	30	5	0	45	angular	-	-	abundant	fine	-		E.DYB
D026	R	15+			-	-	-	-	-							-	-	-	-	L	15	E.DYB
D027	LFH	5	0		-	-	-	-	-							-	-	-	-	-		O.G
D027	Bm	0	5	sic	moderate	fine	subangular blocky	moist	10YR 3/4	0	0	0	0	0	-	-	-	-	-	-		O.G
D027	Bg	5	25	c	-	-	massive	wet	5Y 4/1	0	0	0	0	0	-	few	medium	-	-	-		O.G
D027	IICg	25+		c	moderate	fine	subangular blocky	wet	5Y 4/2	0	0	0	0	0	-	-	-	-	-	-		O.G
D028	LFH	8	0		-	-	-	-	-	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.SC
D028	Ah	0	12	sil	weak	very fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.SC
D028	Bm	12	20	cl	moderate	fine	subangular blocky	moist	10YR 3/4	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.SC
D028	Cgj	20	30	sicl	-	-	massive	wet	2.5Y 3/3	0	0	0	0	0	-	-	-	-	-	-		BRD.SC
D028	Cz	30+			-	-	-	-	-							-	-	-	-	Permafrost	30	BRD.SC
D029	LFH	10	0		-	-	-	-	-							-	-	-	-	-		BRD.TC
D029	Ahy	0	10	sil	weak	fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	-	-	-	-		BRD.TC
D029	Bmy	10	25	sicl	moderate	fine	subangular blocky	moist	10YR 3/3	0	10	0	0	10	round	few	medium	few	fine	-		BRD.TC
D029	Cy	25	40	sicl	-	-	massive	wet	2.5/10Y	5	10	0	0	15	round	-	-	-	-	-		BRD.TC
D029	Cz	40+			-	-	-	-	-							-	-	-	-	Permafrost	40	BRD.TC
D030	LF	25	20		-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-		HD.TC
D030	Of	20	15		-	-	-	-	-	0	0	0	0	0	-	-	-	abundant	fine	-		HD.TC
D030	Omy	15	0		-	-	-	-	-	0	0	0	0	0	-	-	-	abundant	fine	-		HD.TC
D030	Bmy	0	10	sil	weak	very fine	granular	wet	10YR 3/3	0	0	0	0	0	-	-	-	plentiful	fine	-		HD.TC
D030	Cgy	10	20	sicl	-	-	massive	wet	5/10GY	0	0	0	0	0	-	-	-	-	-	-		HD.TC
D030	Cz	20+			-	-	-	-	-							-	-	-	-	Permafrost	20	HD.TC
D031	LFH	7	0		-	-	-	-	-							-	-	abundant	medium	-		GL.TC
D031	Ahy	0	8		weak	fine	granular	moist	10YR 3/2	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D031	Cgy	8	28	sil	moderate	medium	subangular blocky	moist	2.5Y 4/2	0	0	0	0	0	-	many	coarse	few	fine	-		GL.TC
D031	Cz	28+			-	-	-	-	-							-	-	-	-	Permafrost	28	GL.TC
D032	LF	3	0		-	-	-	-	-							-	-	abundant	fine	-		GL.TC
D032	Cg	0	15	sl	weak	fine	subangular blocky	moist	4/5GY	5	10	0	0	15	round	few	fine	plentiful	fine	-		GL.TC
D032	Cgy	15	44	l	-	-	massive	wet	4/10Y	5	10	5	0	20	round	few	fine	plentiful	-	-		GL.TC
D032	Cz	44+			-	-	-	-	-							-	-	-	-	Permafrost	44	GL.TC
D033	Cz	30+			-	-	-	-	-							-	-	-	-	Permafrost	30	HR.SC
D033	Of	25	15		-	-	-	-	-							-	-	abundant	fine	-		HR.SC
D033	Oh	15	10		-	-	-	-	-							-	-	abundant	fine	-		HR.SC
D033	Om	10	0		-	-	-	-	-							-	-	abundant	fine	-		HR.SC
D033	Cg	0	30	sicl	-	-	massive	wet	3/5GY	0	0	0	0	0	-	many	coarse	-	-	-		HR.SC
D034	LFH	4	0		-	-	-	-	-							-	-	plentiful	fine	-		O.SB
D034	Ah	0	20	sil	weak	fine	granular	moist	10YR 2/1	5	15	20	25	65	angular	-	-	plentiful	fine	-		O.SB
D034	R	20+			-	-	-	-	-							-	-	-	-	L	20	O.SB
D035	LFH	18	15		-	-	-	-	-							-	-	few	fine	-		HR.TC
D035	Om	15	0		-	-	-	-	-							-	-	plentiful	fine	-		HR.TC
D035	Cg	0	20	sicl	-	-	massive	wet	3/5 GY	0	0	0	0	0	-	common	coarse	few	fine	-		HR.TC
D035	Omy	20	25		-	-	-	-	-	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D035	Cz	25+			-	-	-	-	-							-	-	-	-	L	25	HR.TC
D036	LFH	5	0		-	-	-	-	-							-	-	abundant	fine	-		BRD.TC
D036	Bm	0	14	sl	weak	fine	subangular blocky	moist	10YR 3/4	5	5	0	0	10	round	few	fine	plentiful	fine	-		BRD.TC
D036	Bcy	14	45	sl	weak	fine	subangular blocky	moist	10YR 4/2	5	10	0	0	15	round	few	medium	few	fine	-		BRD.TC
D036	Cy	45	80	sl	-	-	-	moist	2.5Y 3/3	5	10	0	0	15	round	few	fine	-	-	-		BRD.TC
D036	Cz	80+			-	-	-	-	-							-	-	-	-	Permafrost	80	BRD.TC
D037	LFH	30	28		-	-	-	-	-							-	-	abundant	fine	-		HR.TC
D037	Om	28	0		-	-	-	-	-							-	-	abundant	fine	-		HR.TC
D037	Bhgy	0	20	sl	-	-	massive	wet	10YR 3/3	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D037	Cz	20+			-	-	-	-	-							-	-	-	-	Permafrost	20	HR.TC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D038	LFH	4	0		-	-	-	-								-	-	plentiful	fine	-		BRD.TC
D038	Bm	0	15	ls	weak	fine	subangular blocky	moist	10YR 4/4	3	2	0	0	5	round	-	-	plentiful	fine	-		BRD.TC
D038	Bcy	15	35	ls	weak	fine	subangular blocky	moist	10YR 4/6	2	3	0	0	5	round	-	-	few	fine	-		BRD.TC
D038	Ahy	35	50	l	moderate	medium	subangular blocky	moist	10YR 2/2	2	3	0	0	5	round	-	-	-	-	-		BRD.TC
D038	Cy	50+		ls	-	-	single grain	moist	2.5Y 4/4	5	5	5	5	20	round	few	fine	-	-	-		BRD.TC
D039	LFH	5	0		-	-	-	-								-	-	-	-	-		E.DYB
D039	Ae	0	3	s	-	-	single grain	moist	10YR 5/1	10	20	20	0	50	round	-	-	-	-	-		E.DYB
D039	Bm	3	30	ls	-	-	single grain	moist	10YR 3/4	10	20	30	0	60	round	-	-	abundant	fine	-		E.DYB
D039	BC	30	60	ls	-	-	single grain	moist	10YR 4/3	10	20	30	5	65	round	-	-	few	fine	-		E.DYB
D040	LF	2	0		-	-	-	-								-	-	few	fine	-		
D040	Bm	0	2	ls	-	-	single grain	moist	10YR 3/2	0	0	0	0	0	-	-	-	few	fine	-		
D040	R	2+			-	-	-	-								-	-	-	-	L	2	
D041	LFH	10	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D041	Ah	0	5		weak	fine	granular	wet	10YR 2/1	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D041	Cgy1	5	25	l	-	-	massive	wet	4/10GY	1	0	0	0	1	round	many	coarse	few	fine	-		GL.TC
D041	Cgy2	25	50	l	-	-	massive	wet	5Y 4/2	5	0	0	0	5	round	many	medium	-	-	-		GL.TC
D041	Cz	50+			-	-	-	-								-	-	-	-	Permafrost	50	GL.TC
D042	Ae	0	3	ls	-	-	single grain	moist	10YR 5/1	3	3	0	0	6	round	-	-	plentiful	fine	-		E.DYB
D042	Bm	3	13	ls	-	-	single grain	moist	10YR 3/4	0	0	0	0	0	-	-	-	plentiful	fine	-		E.DYB
D042	BC	13	50	s	-	-	single grain	moist	2.5Y 4/2	0	0	0	0	0	-	-	-	few	fine	-		E.DYB
D042	C	50	80	s	-	-	single grain	moist	2.5Y 3/3	0	0	0	0	0	-	-	-	-	-	-		E.DYB
D043	LFH	5	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D043	Ahy	0	15	cl	moderate	fine	granular	moist	10YR 2/2	1	1	0	0	2	round	-	-	abundant	fine	-		BRD.TC
D043	Bmy	15	30	cl	moderate	fine	subangular blocky	moist	10YR 3/3	2	3	0	0	5	round	-	-	few	fine	-		BRD.TC
D043	Bcy	30	40	cl	moderate	very fine	subangular blocky	moist	10YR 3/2	2	3	0	0	5	round	-	-	-	-	-		BRD.TC
D043	Ahy	40	46	sil	moderate	very fine	subangular blocky	moist	10YR 2/1	0	0	0	0	0	-	-	-	-	-	-		BRD.TC
D043	Cz	46+			-	-	-	-								-	-	-	-	Permafrost	46	BRD.TC
D044	LF	22	20		-	-	-	-								-	-	-	-	-		HR.SC
D044	Om	20	0		-	-	-	-								-	-	-	-	-		HR.SC
D044	Cg	0	20	sicl	-	-	massive	wet	4/10Y	0	0	0	0	0	round	common	coarse	few	fine	-		HR.SC
D044	Cz	20+			-	-	-	-								-	-	-	-	Permafrost	20	HR.SC
D045	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D045	Ah	0	11	sil	moderate	very fine	granular	moist	10Y 2/1	5	0	0	0	5	round	-	-	abundant	fine	-		GL.TC
D045	Cgy	11	25	cl	moderate	medium	subangular blocky	moist	2.5Y 3/2	10	10	0	0	20	round	common	medium	plentiful	fine	-		GL.TC
D045	Bhy	25	45	cl	moderate	medium	subangular blocky	moist	5Y 3/2	10	10	0	0	20	round	few	fine	plentiful	fine	-		GL.TC
D045	Cgy2	45	80	l	moderate	medium	subangular blocky	moist	2.5/10Y	5	10	0	0	15	round	-	-	-	-	-		GL.TC
D045	Cz	80+			-	-	-	-								-	-	-	-	Permafrost	80	GL.TC
D046	LFH	3	0		-	-	-	-								-	-	few	fine	-		O.SB
D046	Ah	0	10	sil	weak	fine	granular	moist	10YR 2/2	5	5	0	0	10	round	-	-	abundant	fine	-		O.SB
D046	R	10+			-	-	-	-								-	-	-	-	L	10	O.SB
D047	LFH	5	0		-	-	-	-								-	-	plentiful	fine	-		GL.SC
D047	Ah	0	3	sil	weak	fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	plentiful	fine	-		GL.SC
D047	Cg1	3	20	sil	-	-	massive	moist	5/10Y	0	0	0	0	0	-	-	-	few	fine	-		GL.SC
D047	Cg2	20	42	sicl	-	-	massive	wet	5/5GY	0	0	0	0	0	-	-	-	-	-	-		GL.SC
D047	Cz	42+			-	-	-	-								-	-	-	-	Permafrost	42	GL.SC
D048	LFH	7	0		weak	fine	subangular blocky	-								-	-	abundant	fine	-		BRD.SC
D048	Bm	0	10	l	weak	fine	subangular blocky	moist	2.5Y 4/2	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.SC
D048	Cg	10	31	cl	-	-	massive	wet	4/10Y	0	0	0	0	0	-	few	medium	few	fine	-		BRD.SC
D048	Cz	31+			-	-	-	-								-	-	-	-	Permafrost	31	BRD.SC
D049	Cg2	30	58	sicl	-	-	massive	wet	5Y 4/1	0	0	0	0	0	-	common	medium	abundant	fine	-		OD.SC
D049	Cz	58+			-	-	-	-								-	-	-	-	Permafrost	58	OD.SC
D049	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		OD.SC
D049	BM	0	2	sil	moderate	fine	granular	moist	10YR 4/1	0	0	0	0	0	-	-	-	abundant	fine	-		OD.SC
D049	Cg1	2	30	sicl	moderate	fine	subangular blocky	moist	2.5Y 4/1	0	0	0	0	0	-	common	medium	abundant	fine	-		OD.SC
D050	LFH	1	0		-	-	-	-								-	-	-	-	-		GL.TC
D050	Cg	0	40	sil	moderate	fine	subangular blocky	moist	5Y 4/1	0	0	0	0	0	-	many	-	abundant	fine	-		GL.TC
D050	Cgy	40	55	sil	-	-	massive	moist	4/10Y	0	0	0	0	0	-	few	-	few	fine	-		GL.TC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D050	Cz	55+			-	-	-	-								-	-	-	-	Permafrost	55	GL.TC
D051	LF	2	0		-	-	-	-								-	-	few	fine	-		E.SB
D051	Ahe	0	3	ls	-	-	single grain	moist	10YR 4/1	10	15	15	10	50	round	-	-	abundant	fine	-		E.SB
D051	Bm	3	25	ls	-	-	single grain	moist	7.5YR 4/6	10	15	15	10	50	round	-	-	abundant	fine	-		E.SB
D051	BC	25	60	s	-	-	single grain	moist	10YR 4.4	5	10	5	0	20	round	-	-	few	fine	-		E.SB
D051	C	60+		s	-	-	single grain	moist	10YR 5/3	10	5	5	0	20	round	-	-	few	fine	-		E.SB
D052	LF	4	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D052	Cg1	0	20	sicl	moderate	fine	subangular blocky	moist	5Y 3/2	0	0	0	0	0	-	many	coarse	few	fine	-		GL.TC
D052	Cg2	20	55	sicl	-	-	massive	moist	5Y 4/2	0	0	0	0	0	-	few	fine	few	fine	-		GL.TC
D052	Cgy	55	65	sicl	-	-	massive	moist	3/10G	0	0	0	0	0	-	-	-	-	-	-		GL.TC
D052	Cz	65+			-	-	-	-								-	-	-	-	Permafrost	65	GL.TC
D053	LFH	5	0		-	-	-	-								-	-	plentiful	fine	-		O.DYB
D053	Ah	0	5	sil	weak	fine	granular	-	10YR 2/2	5	10	5	0	20	angular	-	-	abundant	fine	-		O.DYB
D053	Bm	5	20	ls	-	-	single grain	moist	7.5YR 3/4	10	25	10	0	45	angular	-	-	plentiful	fine	-		O.DYB
D053	R	20+			-	-	-	-								-	-	-	-	L	20	O.DYB
D054	Of	0	10		-	-	-	-								-	-	plentiful	fine	-		ME.OC
D054	Oh	10	16		-	-	-	-								-	-	plentiful	fine	-		ME.OC
D054	Om	16	30		-	-	-	-								-	-	few	fine	-		ME.OC
D054	Om2	30+			-	-	-	-								-	-	-	-	Permafrost	30	ME.OC
D055	LF	22	20		-	-	-	-								-	-	-	-	-		HU.FO
D055	H	20	0		-	-	-	-								-	-	-	-	-		HU.FO
D055	Ah	0	4	sil	moderate	fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	plentiful	fine	-		HU.FO
D055	R	4+			-	-	-	-								-	-	-	-	L	4	HU.FO
D056	LFH	10	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D056	Bmy	0	16	sil	weak	fine	subangular blocky	wet	10YR 4/3	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D056	Cgy	16	33	sicl	moderate	very fine	subangular blocky	wet	4/5GY	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D056	Cz	33+			-	-	-	-								-	-	-	-	Permafrost	33	BRD.TC
D057	Lf	2	0		-	-	-	-								-	-	few	fine	-		BRD.TC
D057	Bm	0	15	sic	moderate	fine	subangular blocky	moist	10YR 4/3	0	0	0	0	0	-	-	-	plentiful	fine	-		BRD.TC
D057	Bg	15	30	sic	-	-	massive	moist	2.5Y 3/2	0	0	0	0	0	-	few	fine	-	-	-		BRD.TC
D057	Cgy	30	55	sicl	-	-	massive	wet	2.5/10Y	0	0	0	0	0	-	few	medium	-	-	-		BRD.TC
D057	Cz	55+			-	-	-	-								-	-	-	-	Permafrost	55	BRD.TC
D058	LF	20	15		-	-	-	-								-	-	abundant	fine	-		HR.SC
D058	Of	15	0		-	-	-	-								-	-	abundant	fine	-		HR.SC
D058	Cg	0	50	sicl	-	-	massive	wet	5/5BG	0	0	0	0	0	-	-	-	few	fine	-		HR.SC
D058	Cz	50+			-	-	-	-								-	-	-	-	Permafrost	50	HR.SC
D059	LFH	4	0		-	-	-	-								-	-	abundant	fine	-		O.DYB
D059	Ah	0	5	sil	weak	fine	granular	moist	10YR 2/2	5	5	5	0	15	round	-	-	abundant	fine	-		O.DYB
D059	Bm	5	16	ls	weak	fine	subangular blocky	moist	10YR 4/3	15	10	0	0	25	round	-	-	plentiful	fine	-		O.DYB
D059	BC1	15	33	ls	weak	fine	subangular blocky	moist	2.5Y 5/3	10	15	5	0	30	round	-	-	few	fine	-		O.DYB
D059	BC2	33	60	ls	weak	fine	subangular blocky	moist	2.5Y 5/3	10	15	5	0	30	round	-	-	-	-	-		O.DYB
D060	LFH	5	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D060	Ahy	0	15	sil	moderate	very fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D060	Cgy	15	35	sil	moderate	fine	subangular blocky	moist	10YR 4/3	0	0	0	0	0	-	few	fine	plentiful	fine	-		GL.TC
D060	Cg	35	70	sil	moderate	medium	subangular blocky	moist	10YR 4/2	0	0	0	0	0	-	few	fine	few	fine	-		GL.TC
D060	R	70+			-	-	-	-								-	-	-	-	L	70	GL.TC
D061	LFH	4	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D061	Ahy	0	10	sil	weak	fine	granular	moist	10YR 3/1	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D061	Cgy1	10	40	sicl	moderate	medium	subangular blocky	moist	4/5GY	0	0	0	0	0	-	many	medium	few	fine	-		GL.TC
D061	Cg2	40+		sil	-	-	massive	moist	4/10Y	0	0	0	0	0	-	many	medium	-	-	-		GL.TC
D062	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		E.DYB
D062	Aej	0	2	sl	weak	fine	subangular blocky	moist	10YR 6/2	5	5	0	0	10	round	-	-	abundant	fine	-		E.DYB
D062	Bm	2	20	sl	weak	medium	subangular blocky	moist	10YR 4/4	5	10	0	0	15	round	-	-	plentiful	fine	-		E.DYB
D062	BC	20	50	ls	-	-	single grain	moist	10YR 4/3	10	20	0	0	30	round	-	-	few	fine	-		E.DYB
D063	LF	2	0		-	-	-	-								-	-	-	-	-		O.DYB
D063	Ah	0	6	sil	weak	fine	granular	moist	10YR 2/1	10	5	10	0	25	angular	-	-	plentiful	fine	-		O.DYB
D063	Bm	6	10	sil	weak	fine	subangular blocky	moist	10YR 3/4	15	10	10	0	35	angular	-	-	plentiful	fine	-		O.DYB

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
D063	R	10+			-	-	-	-								-	-	-	-	L	10	O.DYB
D064	LFH	10	0		-	-	-	-								-	-	abundant	fine	-		E.DYB
D064	Aej	0	4	ls	weak	very fine	subangular blocky	moist	10YR 5/2	20	10	0	0	30	round	-	-	plentiful	fine	-		E.DYB
D064	Bm	4	16	sl	weak	fine	subangular blocky	moist	10YR 4/3	15	15	5	0	35	round	few	fine	plentiful	fine	-		E.DYB
D064	BC	16	60	sl	weak	medium	subangular blocky	moist	2.5Y 4/4	10	20	5	0	35	round	-	-	few	fine	-		E.DYB
D065	LFH	2	0		-	-	-	-								-	-	plentiful	fine	-		O.DYB
D065	Ah	0	2	sl	weak	fine	granular	moist	10YR 2/1	2	3	5	5	15	round	-	-	abundant	fine	-		O.DYB
D065	Bm	2	18	ls	weak	fine	subangular blocky	moist	10YR 3/4	5	10	5	5	25	round	few	fine	plentiful	fine	-		O.DYB
D065	BC	18	80	sl	weak	medium	subangular blocky	moist	2.5Y 3/3	10	5	3	2	20	round	-	-	few	fine	-		O.DYB
D066	LFH	3	0		-	-	-	-								-	-	plentiful	fine	-		BRD.TC
D066	Bm	0	20	sl	weak	medium	subangular blocky	moist	10YR 4/3	10	0	0	0	10	round	-	-	plentiful	fine	-		BRD.TC
D066	BC	20	40	sl	weak	fine	subangular blocky	wet	10YR 4/4	0	0	0	0	0	-	-	-	few	fine	-		BRD.TC
D066	Cy	40	85	sl	weak	fine	subangular blocky	wet	2.5Y 3/2	0	0	0	0	0	-	-	-	few	fine	-		BRD.TC
D066	Cz	85+			-	-	-	-								-	-	-	-	Permafrost	85	BRD.TC
D067	LF	2	0		-	-	-	-								-	-	few	fine	-		GL.TC
D067	Cg1	0	20	sil	moderate	fine	subangular blocky	moist	4/10Y	0	0	0	0	0	-	few	fine	plentiful	fine	-		GL.TC
D067	Cg2	20	50	sil	moderate	very fine	subangular blocky	moist	2.5/N	0	0	0	0	0	-	few	medium	few	fine	-		GL.TC
D067	Cgy	50	67	sil	moderate	medium	subangular blocky	moist	2.510/Y	0	0	0	0	0	-	-	-	-	-	-		GL.TC
D067	Cz	67+			-	-	-	-								-	-	-	-	Permafrost	67	GL.TC
D068	LFH	5	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D068	Bm	0	20	sl	weak	medium	subangular blocky	moist	10YR 3/2	5	5	0	0	10	round	common	medium	abundant	fine	-		BRD.TC
D068	Cg	20	45	ls	weak	medium	subangular blocky	moist	2.5Y 4/4	5	5	0	0	10	round	-	coarse	few	fine	-		BRD.TC
D068	Cy	45	75	l	moderate	medium	subangular blocky	moist	10YR 2/2	2	3	0	0	5	round	-	-	few	fine	-		BRD.TC
D068	Cz	75+			-	-	-	-								-	-	-	-	Permafrost	75	BRD.TC
D069	LFH	7	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D069	Bm	0	20	sl	weak	medium	subangular blocky	moist	10YR 3/4	5	5	0	0	10	round	few	fine	abundant	fine	-		BRD.TC
D069	Cgy	20	70	sl	-	-	massive	wet	2.5Y 3/3	10	5	0	0	15	round	few	fine	few	fine	-		BRD.TC
D070	LFH	6	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D070	Ah	0	5	sl	weak	medium	subangular blocky	moist	10YR 2/1	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D070	Bm	5	15	sl	weak	medium	subangular blocky	moist	10YR 4/3	0	0	0	0	0	-	few	fine	few	fine	-		BRD.TC
D070	Cg	15	45	ls	weak	medium	subangular blocky	moist	2.5Y 5/3	2	0	0	0	2	round	common	coarse	few	fine	-		BRD.TC
D070	Cgy	45	60	ls	-	-	massive	wet	5Y 5/4	1	0	0	0	1	round	-	fine	abundant	-	-		BRD.TC
D070	Cz	60+			-	-	-	-								-	-	-	-	Permafrost	60	BRD.TC
D071	LFH	4	0		-	-	-	-								-	-	abundant	fine	-		BRD.SC
D071	Bm	0	15	ls	weak	fine	subangular blocky	moist	10YR 3/4	15	5	0	0	30	round	few	fine	plentiful	fine	-		BRD.SC
D071	Cg1	15	40	ls	weak	medium	subangular blocky	moist	2.5Y 4/2	10	10	0	0	20	round	few	fine	few	fine	-		BRD.SC
D071	Cg2	40	60	ls	-	-	single grain	wet	2.5Y 3/3	10	15	0	0	25	round	-	-	-	-	-		BRD.SC
D071	Cz	60+			-	-	-	-								-	-	-	-	Permafrost	60	BRD.SC
D072	LFH	4	0		-	-	-	-								-	-	-	-	-		GL.TC
D072	Bm	0	6	sil	moderate	very fine	subangular blocky	moist	10YR 3/3	0	0	0	0	0	-	-	-	few	fine	-		GL.TC
D072	Cg	6	25	sil	-	-	massive	moist	2.5Y 4/3	0	0	0	0	0	-	-	-	few	fine	-		GL.TC
D072	Cgy	25	60	sil	-	-	massive	moist	2.5Y 3/3	0	0	0	0	0	-	few	fine	-	-	-		GL.TC
D072	Cz	60+			-	-	-	-								-	-	-	-	Permafrost	60	GL.TC
D073	LFH	2	0		-	-	-	-								-	-	plentiful	fine	-		O.SB
D073	Ah	0	10	sil	weak	fine	granular	moist	10YR 3/3	10	40	10	0	60	angular	-	-	abundant	fine	-		O.SB
D073	R	10+			-	-	-	-								-	-	-	-	L	10	O.SB
D074	LFH	2	0		-	-	-	-								-	-	few	fine	-		E.DYB
D074	Ahe	0	3	ls	weak	fine	subangular blocky	moist	10YR 4/1	15	10	10	0	35	round	-	-	abundant	fine	-		E.DYB
D074	Bm	3	20	sl	weak	fine	subangular blocky	moist	10YR 4/6	10	10	20	0	40	round	-	-	abundant	fine	-		E.DYB
D074	BC	20	40	ls	weak	fine	subangular blocky	moist	10YR 5/3	10	15	10	0	35	round	-	-	few	fine	-		E.DYB
D074	C	40+		ls	-	-	single grain	moist	2.5Y 5/3	15	15	10	0	40	round	-	-	-	-	-		E.DYB
D075	LFH	5	0		-	-	-	-								-	-	plentiful	fine	-		BRD.TC
D075	Bm	0	15	ls	weak	fine	subangular blocky	moist	7.5YR 3/4	5	0	0	0	5	round	-	-	plentiful	fine	-		BRD.TC
D075	Cy	15	40	ls	weak	medium	subangular blocky	wet	7.5YR 3/4	5	0	0	0	5	round	-	-	few	fine	-		BRD.TC
D075	Cgy	40+		ls	weak	medium	subangular blocky	wet	2.5Y 4/2	5	0	0	0	5	round	-	-	-	-	-		BRD.TC
D076	LFH	6	0		-	-	-	-								-	-	abundant	fine	-		BRD.TC
D076	Bm	0	15	sl	weak	fine	subangular blocky	wet	10YR 3/4	10	0	0	0	10	round	-	-	abundant	fine	-		BRD.TC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
D076	Cg	15	40	sl	weak	medium	subangular blocky	wet	2.5Y 5/3	5	0	0	0	5	round	-	-	few	fine	-		BRD.TC
D076	Cy	40	70	sl	-	-	massive	wet	10YR 5/3	2	0	0	0	2	round	-	-	-	-	-		BRD.TC
D077	LFH	1	0		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		GL.TC
D077	Bg	0	20	sicl	-	medium	platy	moist	5/5GY	0	0	0	0	0	-	many	coarse	abundant	fine	-		GL.TC
D077	Cg	20	40	sicl	moderate	coarse	platy	moist	4/5GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.TC
D077	Cgy	40	55	sicl	-	-	massive	wet	5Y 3/2	0	0	0	0	0	-	few	fine	-	-	-		GL.TC
D077	Cz	55+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	55	GL.TC
D078	Bm	0	10	s	-	-	single grain	moist	10YR 4/4	20	10	0	0	30	round	-	-	few	fine	-		O.DYB
D078	BC1	7	20	s	-	-	single grain	moist	2.5Y 3/3	80	10	0	0	90	round	-	-	few	fine	-		O.DYB
D078	BC2	20	50	s	-	-	single grain	moist	10YR 3/4	10	20	0	0	30	round	-	-	few	fine	-		O.DYB
D078	C	50	70	s	-	-	single grain	moist	10YR 3/3	60	25	0	0	85	round	-	-	-	-	-		O.DYB
D079	LF	12	10		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		R.G
D079	Om	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		R.G
D079	Cg	0	60	sicl	-	-	massive	wet	4/10GY	0	0	0	0	0	-	-	-	-	-	-		R.G
D080	LFH	4	0		-	-	massive	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		GL.SC
D080	Bg	0	20	sicl	-	-	massive	moist	4/5GY	0	0	0	0	0	-	many	coarse	few	fine	-		GL.SC
D080	Cg	20	80	sicl	-	-	massive	moist	4/10GY	0	0	0	0	0	-	many	medium	-	-	-		GL.SC
D080	Cz	80+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	80	GL.SC
D081	Cg	20	55	sicl	moderate	coarse	platy	moist	2.5Y 3/2	0	0	0	0	0	-	common	fine	-	-	-		OD.SC
D081	Cz	55+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	55	OD.SC
D081	LFH	3	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		OD.SC
D081	BM	0	5	sicl	moderate	fine	subangular blocky	moist	10YR 3/4	0	0	0	0	0	-	-	-	abundant	fine	-		OD.SC
D081	Bg	5	20	sicl	moderate	medium	subangular blocky	moist	2.5Y 4/2	0	0	0	0	0	-	-	-	abundant	fine	-		OD.SC
D082	LF	2	0		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		E.DYB
D082	Ahe	0	4	ls	weak	very fine	subangular blocky	moist	10YR 3/2	3	2	0	0	5	round	-	-	abundant	fine	-		E.DYB
D082	Bm	4	20	sl	weak	fine	subangular blocky	moist	10YR 4/6	10	5	0	0	15	round	-	-	plentiful	fine	-		E.DYB
D082	BC	20	40	ls	weak	medium	subangular blocky	moist	10YR 5/2	7	8	0	0	15	round	-	-	few	fine	-		E.DYB
D082	C	40	70	ls	-	-	single grain	moist	2.5Y 5/2	10	15	0	0	25	round	-	-	few	fine	-		E.DYB
D083	LF	17	15		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		HR.SC
D083	Om	15	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	N		HR.SC
D083	Cg1	0	20	sil	moderate	medium	subangular blocky	wet	3.5GY	0	0	0	0	0	-	few	medium	few	fine	-		HR.SC
D083	Cg2	20	38	sil	-	-	massive	wet	2.5/5GY	0	0	0	0	0	-	-	-	few	fine	-		HR.SC
D083	Cz	38+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	38	HR.SC
D084	LFH	8	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		BRD.TC
D084	Bm	0	12	sl	weak	fine	subangular blocky	wet	10YR 4/3	5	5	0	0	10	round	-	-	abundant	fine	-		BRD.TC
D084	Bgy	12	30	ls	weak	medium	subangular blocky	moist	2.5Y 4/3	10	10	0	0	20	round	few	fine	plentiful	fine	-		BRD.TC
D084	Cy	30	60	sl	weak	fine	subangular blocky	wet	2.5Y 3/3	15	10	0	0	25	round	few	fine	few	fine	Permafrost	60	BRD.TC
D085	LFH	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		R.SC
D085	Cg	0	30	sicl	-	-	massive	moist	4.5GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		R.SC
D085	Cz	30+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	30	R.SC
D086	LF	3	0		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		O.DYB
D086	Ahe	0	3	sl	weak	fine	single grain	moist	10YR 4/2	2	3	0	0	5	round	-	-	plentiful	fine	-		O.DYB
D086	Bm	3	15	sl	weak	fine	subangular blocky	moist	10YR 4/6	5	5	10	0	20	round	-	-	plentiful	fine	-		O.DYB
D086	R	15+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	15	O.DYB
D087	LFH	6	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		GL.TC
D087	Bg	0	25	sil	moderate	medium	subangular blocky	moist	4/10Y	0	0	0	0	0	-	-	-	-	-	-		GL.TC
D087	Cg	25	32	sil	-	-	massive	moist	4/10Y	0	0	0	0	0	-	many	coarse	-	-	-		GL.TC
D087	Cgy	32	40	sicl	-	-	massive	wet	5/10Y	0	0	0	0	0	-	common	medium	few	fine	-		GL.TC
D087	Cz	40+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	40	GL.TC
D088	LFH	3	0		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		O.DYB
D088	Bm	0	20	ls	weak	medium	subangular blocky	wet	10YR 4/4	5	5	10	0	20	round	-	-	plentiful	fine	N		O.DYB
D088	BC	20	40	ls	weak	medium	subangular blocky	moist	10YR 5/3	10	5	5	0	20	round	-	-	few	fine	-		O.DYB
D088	C	40	60	ls	weak	medium	subangular blocky	moist	2.5Y 5/2	5	10	10	0	25	round	-	-	few	fine	-		O.DYB
D089	LFH	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
D089	Bm	0	4	sl	weak	very fine	subangular blocky	moist	7.5YR 3/4	3	1	0	0	4	angular	-	-	abundant	fine	-		
D089	R	4+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	4	
D090	LFH	11	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		GL.TC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D090	Bg	0	15	sicl	moderate	fine	subangular blocky	moist	5/5GY	0	0	0	0	0	-	many	medium	abundant	fine	N		GL.TC
D090	Cg	15	40	sicl	-	-	massive	wet	5/10Y	0	0	0	0	0	-	many	coarse	few	fine	-		GL.TC
D090	Cgy	40	55	sicl	-	-	massive	moist	3/10Y	0	0	0	0	0	-	few	fine	-	-	-		GL.TC
D090	Cz	55+			-	-	-	-								-	-	-	-	Permafrost	55	GL.TC
D091	LFH	8	0		-	-	-	-								-	-	plentiful	fine	-		GL.TC
D091	Ah	0	6	sil	moderate	fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D091	Bg	6	25	sicl	moderate	fine	subangular blocky	moist	10YR 3/2	0	0	0	0	0	-	common	fine	abundant	fine	-		GL.TC
D091	Ahy	25	35	I	weak	fine	granular	wet	10YR 2/1	0	0	0	0	0	-	-	-	plentiful	fine	-		GL.TC
D091	Cz	35+			-	-	-	-								-	-	-	-	Permafrost	35	GL.TC
D092	LFH	28	25		-	-	-	-								-	-	few	fine	-		HR.TC
D092	Om	25	0		-	-	-	-								-	-	abundant	fine	-		HR.TC
D092	Cgy	0	20	sil	-	-	massive	wet	3/10Y	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D092	Ahy	20	22	sil	-	-	massive	wet	2.5/N	0	0	0	0	0	-	-	-	few	fine	-		HR.TC
D092	Cz	22+			-	-	-	-								-	-	-	-	Permafrost	22	HR.TC
D093	LFH	2	0		-	-	-	-								-	-	plentiful	fine	-		E.DYB
D093	Ahe	0	4	sl	weak	fine	granular	moist	10YR 3/1	1	1	0	0	2	round	-	-	abundant	fine	-		E.DYB
D093	Bm	4	11	sl	weak	fine	subangular blocky	moist	10YR 5/4	2	3	5	0	10	angular	-	-	abundant	fine	-		E.DYB
D093	R	11+			-	-	-	-								-	-	-	-	L	11	E.DYB
D094	LF	20	15		-	-	-	-								-	-	plentiful	fine	-		HR.SC
D094	Om	10	0		-	-	-	-								-	-	plentiful	fine	-		HR.SC
D094	Cg	0	28	sil	-	-	massive	wet	3/10Y	0	0	0	0	0	-	-	-	few	fine	-		HR.SC
D094	Cz	28+			-	-	-	-								-	-	-	-	Permafrost	28	HR.SC
D095	LFH	2	0		-	-	-	-								-	-	few	fine	-		
D095	Ahe	0	2	sl	weak	very fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	few	fine	-		
D095	R	2+			-	-	-	-								-	-	-	-	L	2	
D096	LFH	3	0		-	-	-	-								-	-	few	fine	-		OD.TC
D096	Ah	0	4	sil	weak	fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	plentiful	fine	-		OD.TC
D096	Bmy	4	12	sl	weak	fine	subangular blocky	moist	10YR 3/6	0	2	0	0	2	round	-	-	plentiful	fine	-		OD.TC
D096	Bcy	12	30	sl	weak	fine	subangular blocky	moist	10YR 4/4	0	5	0	0	5	round	-	-	few	fine	-		OD.TC
D096	Ahy	30	34	sil	weak	fine	granular	wet	10YR 2/1	0	0	0	0	0	-	-	-	few	fine	-		OD.TC
D096	Bcy	34	75	sl	weak	fine	subangular blocky	wet	10YR 3/6	0	5	0	0	5	round	-	-	-	-	-		OD.TC
D096	Cgy	75	90	sl	-	-	single grain	wet	5/5GY	0	0	0	0	0	-	-	-	-	-	-		OD.TC
D096	Cz	90+			-	-	-	-								-	-	-	-	Permafrost	90	OD.TC
D097	Bm	0	25	s	-	-	single grain	moist	10YR 3/6	5	5	0	0	10	round	-	-	-	-	-		O.EB
D097	BC	25	55	s	-	-	single grain	moist	10YR 4/4	2	1	0	0	3	round	-	-	-	-	-		O.EB
D097	Ck	55	90+	s	-	-	single grain	moist	2.5Y 5/5	1	1	0	0	2	round	-	-	-	-	-		O.EB
D098	LF	2	0		-	-	-	-								-	-	plentiful	fine	-		E.DYB
D098	Ahe	0	3	sl	weak	fine	granular	moist	10YR 2/2	5	10	0	0	15	angular	-	-	abundant	fine	-		E.DYB
D098	Bm	3	15	sl	weak	medium	subangular blocky	moist	10YR 3/6	10	10	10	0	30	angular	-	-	abundant	fine	-		E.DYB
D098	BC	15	50	sl	weak	medium	subangular blocky	moist	7.5YR 3/3	10	15	5	0	30	angular	few	fine	-	-	-		E.DYB
D099	LFH	6	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
D099	Bg	0	25	sil	moderate	fine	subangular blocky	moist	4/5GY	0	0	0	0	0	-	many	coarse	abundant	fine	-		GL.SC
D099	Cg	25	47	sicl	-	-	massive	wet	5/5GY	0	0	0	0	0	-	-	coarse	few	fine	-		GL.SC
D099	Cz	47+			-	-	-	-								-	-	-	-	Permafrost	47	GL.SC
D100	LFH	6	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D100	Bg	0	20	sicl	moderate	medium	subangular blocky	moist	4/10Y	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.TC
D100	Cg	20	40	sicl	-	-	massive	moist	4/5GY	0	0	0	0	0	-	many	fine	few	fine	-		GL.TC
D100	Cgy	40	55	sicl	-	-	massive	wet	4/5GY	0	0	0	0	0	-	many	fine	few	fine	-		GL.TC
D100	Cz	55+			-	-	-	-								-	-	-	-	Permafrost	55	GL.TC
D101	LF	0	3		-	-	-	-								-	-	plentiful	fine	-		ME.OC
D101	Of	3	25		-	-	-	-								-	-	abundant	fine	-		ME.OC
D101	Om	25	45		-	-	-	-								-	-	plentiful	fine	-		ME.OC
D101	Omz	45+			-	-	-	-								-	-	-	-	Permafrost	45	ME.OC
D102	LFH	1	0		-	-	-	-								-	-	few	fine	-		E.DYB
D102	Ahe	0	4	sl	weak	fine	granular	moist	10YR 4/1	0	0	0	0	0	-	-	-	abundant	fine	-		E.DYB
D102	Ae	4	15	sl	moderate	fine	angular blocky	moist	10YR 5/1	0	0	0	0	0	-	-	-	abundant	fine	-		E.DYB
D102	Bm	15	22	I	moderate	fine	subangular blocky	moist	10YR 4/3	5	5	0	0	10	round	-	-	plentiful	fine	-		E.DYB

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
D102	BC	22	40	sl	moderate	medium	subangular blocky	moist	2.5Y 5/3	15	10	5	0	30	round	-	-	few	fine	-		E.DYB
D102	C	40	60+	ls	-	-	single grain	moist	2.5Y 3/3	15	10	5	0	30	round	-	-	few	fine	-		E.DYB
D103	LFH	5	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		GL.TC
D103	Bg	0	20	sicl	moderate	medium	subangular blocky	moist	4/5GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.TC
D103	Cg	20	40	sicl	-	-	massive	moist	5/10Y	0	0	0	0	0	-	many	coarse	few	fine	-		GL.TC
D103	Cgy	40	55	sil	-	-	massive	moist	2.5/10Y	0	0	0	0	0	-	-	-	-	-	-		GL.TC
D103	Cz	55+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	55	GL.TC
D104	LFH	15	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		R.G
D104	Cg	0	50	sic	-	-	massive	wet	3/10Y	0	0	0	0	0	-	-	-	abundant	fine	-		R.G
D105	LF	2	0		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	medium	-		O.SB
D105	Ah	0	15	ls	weak	fine	granular	moist	10YR2/2	10	40	10	0	60	angular	-	-	plentiful	fine	-		O.SB
D105	R	15+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	15	O.SB
D106	LFH	2	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		BRD.TC
D106	Bm	0	15	sl	weak	medium	subangular blocky	moist	7.5YR 3/4	10	10	5	0	25	round	-	-	abundant	fine	-		BRD.TC
D106	Ahy	15	20	sl	weak	fine	subangular blocky	moist	10YR 2/2	5	5	0	0	10	round	-	-	abundant	fine	-		BRD.TC
D106	Bcy	20	40	sl	weak	medium	subangular blocky	moist	10YR 3/6	5	10	0	0	15	round	-	-	plentiful	fine	-		BRD.TC
D106	Cy	40	60+	sl	weak	medium	subangular blocky	moist	2.5Y 5/3	10	10	5	0	25	round	-	-	few	fine	-		BRD.TC
D107	LF	12	10		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		HR.SC
D107	Om	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		HR.SC
D107	Cg1	0	20	sicl	moderate	medium	subangular blocky	moist	4/5GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		HR.SC
D107	Cg2	20	32	sicl	-	-	massive	wet	2/5GY	0	0	0	0	0	-	few	fine	few	fine	-		HR.SC
D107	Cz	32+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	32	HR.SC
D108	LF	1	0		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		O.DYB
D108	Ah	0	5	sl	weak	fine	granular	moist	10YR 2/2	5	5	5	0	15	angular	-	-	abundant	fine	-		O.DYB
D108	Bm	5	20	sl	moderate	fine	subangular blocky	moist	7.5YR 3/3	10	15	10	0	35	angular	-	-	abundant	fine	-		O.DYB
D108	R	20+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	20	O.DYB
D109	LF	12	10		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		HU.OC
D109	Oh	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		HU.OC
D109	Ahy	0	4	sil	moderate	very fine	granular	moist	10YR 2/1	0	0	0	0	0	-	-	medium	few	-	-		HU.OC
D109	Bmy	4	8	sil	weak	fine	granular	moist	10YR 3/4	0	0	0	0	0	-	-	-	abundant	fine	-		HU.OC
D109	Ohy	8	18		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		HU.OC
D109	Ohz	18+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	18	HU.OC
D110	LF	18	15		-	-	-	-	-	-	-	-	-	-	-	-	-	plentiful	fine	-		HR.SC
D110	Om	15	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		HR.SC
D110	Bg	0	26	sicl	moderate	coarse	subangular blocky	wet	5Y 3/2	0	0	0	0	0	-	-	-	plentiful	fine	-		HR.SC
D110	Cz	26+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	26	HR.SC
D111	LF	0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		ME.OC
D111	Om	5	20		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		ME.OC
D111	IIC	20	25	cl	-	-	massive	wet	5Y 4/2	0	0	0	0	0	-	-	-	abundant	fine	-		ME.OC
D111	Omy	25	55		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		ME.OC
D111	Omz	55+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	55	ME.OC
D112	LFH	2	0		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		BRD.TC
D112	Bm	0	15	l	moderate	very fine	subangular blocky	moist	10Y 3/4	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D112	Cg	15	33	l	moderate	fine	subangular blocky	moist	2.5Y 3/3	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D112	Cgy	33	46	l	moderate	fine	subangular blocky	moist	2.5Y 2.5/1	0	0	0	0	0	-	-	-	abundant	fine	-		BRD.TC
D112	Cz	46+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	46	BRD.TC
D113	LFH	9	0		-	-	-	-	-	-	-	-	-	-	-	-	-	abundant	fine	-		GL.TC
D113	Bg	0	22	sicl	moderate	fine	subangular blocky	moist	5/5GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.TC
D113	Cg	22	46	sicl	moderate	medium	subangular blocky	moist	5/10Y	0	0	0	0	0	-	many	medium	plentiful	fine	-		GL.TC
D113	Cgy	46	55	sicl	-	-	massive	wet	3/10Y	0	0	0	0	0	-	few	fine	few	fine	-		GL.TC
D113	Cz	55+			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permafrost	55	GL.TC
D114	LFH	2	0		-	-	-	-	-	-	-	-	-	-	-	-	-	few	fine	-		BRD.TC
D114	Bm	0	10	sl	weak	medium	subangular blocky	moist	10YR 4/4	1	0	0	0	1	round	-	-	plentiful	fine	-		BRD.TC
D114	BC	10	25	sl	weak	fine	subangular blocky	moist	10YR 5/2	2	0	0	0	2	round	-	-	plentiful	fine	-		BRD.TC
D114	Bmy	25	40	ls	weak	medium	subangular blocky	moist	10YR 3/4	5	10	0	0	15	round	-	-	plentiful	fine	-		BRD.TC
D114	Cy	40	65+	ls	weak	medium	subangular blocky	moist	2.5Y 5/2	10	10	0	0	20	round	-	-	few	fine	-		BRD.TC
D115	LFH	10	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		GL.SC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
D115	Bg	0	15	sic	moderate	fine	subangular blocky	wet	5/10GY							many	medium	abundant	fine	Permafrost	72	GL.SC
D115	Cg	15	72	sic	-	-	massive	wet	4/5GY							-	-	few	fine	Permafrost	72	GL.SC
D115	Cz	72+			-	-	-	-								-	-	-	-	Permafrost	72	GL.SC
D116	LFH	5	0		-	-	-	-								-	-	plentiful	fine	-		BRD.TC
D116	Aej	0	1	ls	weak	very fine	subangular blocky	moist	10YR 5/1	5	0	0	0	5	round	-	-	plentiful	fine	-		BRD.TC
D116	Bm	1	20	sl	weak	medium	subangular blocky	moist	7.5YR 3/4	10	10	0	0	20	round	-	-	plentiful	fine	-		BRD.TC
D116	Bmy	20	33	ls	weak	fine	subangular blocky	moist	7.5YR 2.5/3	10	20	0	0	30	round	-	-	plentiful	fine	-		BRD.TC
D116	Bcy	33	50	ls	weak	medium	subangular blocky	moist	10YR 3/4	10	20	0	0	30	round	-	-	few	fine	-		BRD.TC
D116	C	50	80+	ls	weak	fine	subangular blocky	moist	10YR 3/6	10	15	0	0	25	round	-	-	-	-	-		BRD.TC
D117	LFH	2	0		-	-	-	-								-	-	plentiful	fine	-		GL.SC
D117	Bm	0	5	cl	moderate	very fine	subangular blocky	moist	10YR 3/3	0	0	0	0	0	-	many	coarse	abundant	fine	-		GL.SC
D117	Bg	5	25	sicl	moderate	coarse	subangular blocky	moist	5/5GY	0	0	0	0	0	-	many	coarse	abundant	fine	-		GL.SC
D117	Cg1	25	40	sicl	-	-	massive	moist	5/10 GY	0	0	0	0	0	-	many	coarse	plentiful	fine	-		GL.SC
D117	Cg2	40	45	sicl	-	-	massive	moist	4/10 GY	0	0	0	0	0	-	few	fine	few	fine	-		GL.SC
D117	Cz	45+			-	-	-	-								-	-	-	-	Permafrost	45	GL.SC
D118	LFH	2	0		-	-	-	-								-	-	few	fine	-		E.DYB
D118	Aej	0	2	sl	weak	fine	subangular blocky	moist	10YR 6/2	0	0	0	0	0	-	-	-	abundant	fine	-		E.DYB
D118	Bm	2	15	ls	weak	medium	subangular blocky	moist	7.5YR 3/3	2	0	0	0	2	round	-	-	abundant	fine	-		E.DYB
D118	Ahb	15	20	sl	weak	very fine	subangular blocky	moist	10YR 3/3	5	5	0	0	10	round	-	-	abundant	fine	-		E.DYB
D118	IIBC	20	45	sl	weak	medium	subangular blocky	moist	10YR 3/6	5	0	0	0	5	round	-	-	abundant	fine	-		E.DYB
D118	IIIC	45	70+	ls	-	-	single grain	moist	10YR 3/4	15	10	0	0	25	round	-	-	few	fine	-		E.DYB
D119	LFH	6	0		-	-	-	-								-	-	abundant	fine	-		E.DYB
D119	Ae	0	5	ls	weak	fine	subangular blocky	moist	7.5YR 5/2	2	0	0	0	2	round	-	-	abundant	fine	-		E.DYB
D119	Bm	5	20	sl	weak	medium	subangular blocky	moist	7.5YR 3/3	3	0	0	0	3	round	-	-	plentiful	fine	-		E.DYB
D119	BC	20	50	ls	weak	fine	subangular blocky	moist	10YR 3/4	5	0	0	0	5	round	-	-	few	fine	-		E.DYB
D119	BC	50	70+	ls	-	-	single grain	wet	10YR 3/3	5	5	0	0	10	round	-	-	-	-	-		E.DYB
D120	LFH	5	0		-	-	-	-								-	-	abundant	fine	-		O.G
D120	Bg	0	30	sl	weak	fine	subangular blocky	moist	5/10Y	5	10	10	0	25	round	common	coarse	plentiful	fine	-		O.G
D120	Cg	30	60	sl	moderate	fine	subangular blocky	moist	5Y 4/2	10	10	0	0	20	round	few	fine	few	fine	-		O.G
D121	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		O.G
D121	Ahe	0	5	sil	moderate	fine	granular	moist	10YR 3/3	0	0	0	0	0	-	-	-	abundant	fine	-		O.G
D121	Bg	5	16	sl	weak	coarse	subangular blocky	moist	4/10Y	0	5	0	0	5	round	many	medium	plentiful	fine	-		O.G
D121	Cg1	16	40	sl	weak	fine	subangular blocky	moist	2.5Y 5/4	5	10	0	0	15	round	few	fine	few	fine	-		O.G
D121	Cg2	40	60	sl	weak	fine	subangular blocky	moist	2.5Y 4/4	5	5	0	0	10	round	-	-	few	fine	-		O.G
D122	Om	6	0		-	-	-	-								-	-	abundant	fine	-		R.G
D122	C	0	10	sil	weak	fine	subangular blocky	moist	5/10Y	0	0	0	0	0	-	-	-	plentiful	fine	-		R.G
D122	IIOMB	10	25		-	-	-	-								-	-	abundant	fine	-		R.G
D122	IIICg	25	60	sl	-	-	massive	wet	4/10Y	0	2	0	0	2	round	-	-	few	fine	-		R.G
D123	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
D123	Ah	0	5	sil	weak	fine	granular	moist	10YR 2/2	0	0	0	0	0	-	-	-	abundant	fine	-		GL.TC
D123	Bgy	5	20	sil	moderate	medium	subangular blocky	moist	10YR 3/4	0	0	0	0	0	-	few	fine	abundant	fine	-		GL.TC
D123	Cgy	20	45	sil	weak	medium	subangular blocky	moist	10YR3/6	0	0	0	0	0	-	common	fine	plentiful	fine	-		GL.TC
D123	Cz	45+			-	-	-	-								-	-	-	-	Permafrost	45	GL.TC
D124	LF	4	0		-	-	-	-								-	-	abundant	fine	-		E.DYB
D124	Ahe	0	3	sl	moderate	fine	granular	moist	10YR 3/2	0	10	0	0	10	round	-	-	abundant	fine	-		E.DYB
D124	Bm	3	11	sl	moderate	medium	subangular blocky	moist	10YR 4/4	5	10	0	0	15	round	-	-	plentiful	fine	-		E.DYB
D124	BC	11	33	ls	weak	medium	subangular blocky	moist	10YR 5/3	10	15	0	0	25	round	-	-	plentiful	fine	-		E.DYB
D124	R	33+			-	-	-	-								-	-	-	-	L	33	E.DYB
D125	LFH	5	0		-	-	-	-								-	-	abundant	fine	-		O.DYB
D125	Bm	0	10	sl	weak	fine	subangular blocky	moist	10YR 3/6	10	10	0	0	20	round	-	-	abundant	fine	-		O.DYB
D125	BC	6	18	sl	weak	fine	subangular blocky	moist	10YR 4/4	10	15	0	0	25	round	-	-	abundant	fine	-		O.DYB
D125	R	18+			-	-	-	-								-	-	-	-	L	18	O.DYB
D126	LFH	3	0		-	-	-	-								-	-	abundant	fine	-		O.G
D126	Bg	0	30	sl	moderate	coarse	subangular blocky	moist	5/10GY	2	0	0	0	2	round	many	coarse	plentiful	fine	-		O.G
D126	Cg	30+		scl	-	-	massive	wet	2.5Y 3/3	0	0	0	0	0	-	many	coarse	few	fine	-		O.G
D127	no soil	0	0		-	-	-	-								-	-	-	-	-		
D128	LF	2	0		-	-	-	-								-	-	few	fine	-		O.SB

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction		
																				Type	Depth	
D128	Ah	0	13	sl	weak	fine	granular	moist	10YR 2/2	15	25	10	0	50	angular	-	-	abundant	fine	-	-	O.SB
D128	R	13+			-	-	-	-								-	-	-	-	L	13	O.SB
D129	LFH	8	0		-	-	-	-								-	-	abundant	fine	-	-	GL.TC
D129	Cg	0	28	sil	-	-	massive	wet	5Y 5/4	0	0	0	0	0	-	few	fine	plentiful	fine	-	-	GL.TC
D129	Cgy	28	38	sil	-	-	massive	wet	5Y 2.5/1	0	0	0	0	0	-	few	fine	few	fine	-	-	GL.TC
D129	Cz	38+			-	-	-	-								-	-	-	-	Permafrost	38	GL.TC
D130	LFH	5	0		-	-	-	-								-	-	abundant	fine	-	-	E.SB
D130	Ahe	0	15	sil	weak	fine	granular	moist	10YR 2/1	15	30	30	0	75	angular	-	-	abundant	fine	-	-	E.SB
D130	R	15+			-	-	-	-								-	-	-	-	L	15	E.SB
D131	LF	0	5		-	-	-	-								-	-	abundant	fine	-	-	ME.OC
D131	Om	5	40		-	-	-	-								-	-	abundant	fine	-	-	ME.OC
D131	Omz	40+			-	-	-	-								-	-	-	-	Permafrost	40	ME.OC
D132	LFH	4	0		-	-	-	-								-	-	abundant	fine	-	-	BRD.TC
D132	Ah	0	3	sl	weak	fine	granular	moist	10YR 2/2	5	5	15	0	25	round	-	-	abundant	fine	-	-	BRD.TC
D132	Bm	3	20	sl	weak	medium	subangular blocky	moist	10YR 3/4	10	15	15	0	40	round	-	-	abundant	fine	-	-	BRD.TC
D132	BC	20	40	sl	weak	medium	subangular blocky	moist	10YR 4/4	5	10	10	0	25	round	-	-	plentiful	fine	-	-	BRD.TC
D132	C	40	60	sl	weak	medium	subangular blocky	moist	10YR 3/2	5	5	0	0	10	round	-	-	few	fine	-	-	BRD.TC
D132	Cy	60+		ls	-	-	single grain	wet	10YR 3/2	0	0	0	0	0	-	-	-	-	-	-	-	BRD.TC
D133	LFH	7	0		-	-	-	-								-	-	abundant	fine	-	-	GL.TC
D133	Bg	0	20	sicl	moderate	medium	subangular blocky	moist	4.5GY	0	0	0	0	0	-	many	fine	abundant	fine	-	-	GL.TC
D133	Cg	20	60	sil	weak	fine	subangular blocky	moist	3/5GY	0	0	0	0	0	-	common	medium	few	fine	-	-	GL.TC
D133	Cgy	60	72	sil	-	-	massive	wet	2.5/10Y	0	0	0	0	0	-	-	-	few	fine	-	-	GL.TC
D133	Cz	72+			-	-	-	-								-	-	-	-	Permafrost	72	GL.TC
96 4743	H	2	0		-	-	-	-								-	-	abundant	fine	-	-	BR.TC
96 4743	Bm	0	20	sl	-	medium	granular	-	2.5Y 4/4		10	15	0	20		-	-	plentiful	medium	-	-	BR.TC
96 4743	Bmy	20	35	fsl	-	very fine	granular	-	10YR 2/1		4	1	0	5		-	-	abundant	fine	-	-	BR.TC
96 4743	C	35	53	sl	-	fine	granular	-	2.5Y 4/3		10	25	0	35		-	-	few	fine	-	-	BR.TC
96 4751	Bm	0	8	sicl	-	fine	granular	-	2.5Y 5/3							-	-	abundant	fine	Permafrost	39	GL.TC
96 4751	Bgy	8	34	sicl	-	-	massive	-	10Y 4/1							-	-	abundant	fine	Permafrost	39	GL.TC
96 4751	Cz	34+			-	-	-	-								-	-	-	-	Permafrost	39	GL.TC
96 4771	Of	6	0		-	-	-	-								-	-	abundant	fine	Permafrost	30	GL.SC
96 4771	Bg	0	20	sic	-	medium	angular blocky	-	2.5Y 4/2		1	0	0	1		-	-	abundant	fine	Permafrost	30	GL.SC
96 4771	Cg	20	30	sic	-	coarse	subangular blocky	-	2.5Y 3/1		2	0	0	2		-	-	plentiful	fine	Permafrost	30	GL.SC
96 4771	Cz	30+			-	-	-	-								-	-	-	-	Permafrost	30	GL.SC
96 4772	LFH	7	0		-	-	-	-								-	-	plentiful	medium	Permafrost	48	BR.SC
96 4772	Bm	0	23	s	-	fine	granular	-	2.5Y 4/3		0	0	0	0		-	-	plentiful	fine	Permafrost	48	BR.SC
96 4772	Bmgj	23	48	scl	-	medium	granular	-	10YR 4/2		5	0	0	5		-	-	few	fine	Permafrost	48	BR.SC
96 4772	R	42	48		-	-	-	-			85	10	0	95		-	-	-	-	Permafrost	48	BR.SC
96 4772	Cz	48+			-	-	-	-								-	-	-	-	Permafrost	48	BR.SC
96 4773	H	2	0		-	-	-	-								-	-	abundant	medium	Permafrost	55	BR.SC
96 4773	Ae	0	26	s	-	-	single grain	-	2.5Y 6/3							-	-	abundant	medium	Permafrost	55	BR.SC
96 4773	Bg	26	38	ls	-	-	single grain	-	10Y5							-	-	few	fine	Permafrost	55	BR.SC
96 4773	Cg	38	55	ls	-	-	single grain	-	10Y4							-	-	-	fine	Permafrost	55	BR.SC
96 4773	Cz	55+			-	-	-	-								-	-	-	-	Permafrost	55	BR.SC
96 4776	Of	0	45		-	-	-	-								-	-	abundant	fine	Water	31	GL.SC
96 4776	Bmgj	14	50	sicl	-	-	massive	-	2.5Y 4/3							-	-	-	-	Water	31	GL.SC
96 4776	Cg	50	56	l	-	-	massive	-	5Y 3/1							-	-	-	-	Water	31	GL.SC
96 4776	Cz	56+			-	-	-	-								-	-	-	-	Water	31	GL.SC
96 4780	L	17	10		-	-	-	-								-	-	-	-	Permafrost	23	BR.TC
96 4780	Of	10	0		-	-	-	-								-	-	abundant	fine	Permafrost	23	BR.TC
96 4780	Bgjy	0	23	sicl	-	-	massive	-	2.5Y 4/2							-	-	plentiful	fine	Permafrost	23	BR.TC
96 4780	Bz	23+			-	-	-	-								-	-	-	-	Permafrost	23	BR.TC
96 4781	Om	5	0		-	-	-	-								-	-	abundant	fine	-	-	GL.TC
96 4781	Bg	0	39		-	coarse	subangular blocky	-	2.5Y 5/2							-	-	few	fine	-	-	GL.TC
96 4781	Bgy	39	64		-	-	massive	-	2.5Y 4/1							-	-	-	-	-	-	GL.TC
96 4781	Cz	64+			-	-	-	-								-	-	-	-	-	-	GL.TC
96 4782	LF	1	0		-	-	-	-								-	-	few	medium	-	-	O.DYB

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
96 4782	Ae	0	2		-	-	single grain	-	10YR 6/3		10	5	0	20		-	-	abundant	fine	-		O.DYB
96 4782	Bmj	2	12		-	-	single grain	-	7.5YR 4/1		10	5	0	15		-	-	plentiful	fine	-		O.DYB
96 4782	C	12	98+		-	-	single grain	-	10YR 7/2		5	10	0	15		-	-	few	fine	-		O.DYB
96 4787	Of	15	0		-	-	-	-								-	-	abundant	fine	-	10	BR.TC
96 4787	Bmy	0	6		-	fine	granular	-	10YR 5/3							-	-	abundant	fine	-	10	BR.TC
96 4787	Bcy	6	42		-	fine	platy	-	10YR 4/2							-	-	few	fine	-	10	BR.TC
96 4787	Cz	42+			-	-	-	-								-	-	-	-	-	10	BR.TC
96 4788	C1	0	79	s	-	-	single grain	-			15	0	0	15		-	-	few	fine	-		O.R
96 4788	C2	79	120	s	-	-	single grain	-			20	0	0	20		-	-	-	-	-		O.R
96 4788	Cg	120	122	s	-	-	single grain	-	10YR 2.5/1		20	0	0	20		-	-	-	-	-		O.R
96 4788	Cz	122+			-	-	-	-								-	-	-	-	-		O.R
96 4789	LF	2	0		-	-	-	-								-	-	-	-	Permafrost	40	BR.TC
96 4789	Bm	0	22	sicl	-	fine	granular	-	10YR 4/2		50	0	0	40		-	-	abundant	fine	Permafrost	40	BR.TC
96 4789	Om	22	30		-	-	-	-								-	-	plentiful	fine	Permafrost	40	BR.TC
96 4789	Cg	30	40	sil	-	-	massive	-	10YR 5/1		40	0	0	40		-	-	few	fine	Permafrost	40	BR.TC
96 4789	Wz	40+			-	-	-	-								-	-	-	-	Permafrost	40	BR.TC
96 4789	Of	3 cm			-	-	-	-								-	-	plentiful	fine	Permafrost	40	BR.TC
96 4793	F	17	16		-	-	-	-								-	-	abundant	fine	Permafrost	15	BR.SC
96 4793	Om	16	0		-	-	-	-								-	-	abundant	fine	Permafrost	15	BR.SC
96 4793	Ah	0	2	sil	-	-	massive	-	10YR 4/2							-	-	abundant	fine	Permafrost	15	BR.SC
96 4793	Bg	2	15	sicl	-	-	massive	-	2.5Y 5/2							-	-	abundant	fine	Permafrost	15	BR.SC
96 4796	H	1	0		-	-	-	-								-	-	abundant	fine	-		O.HR
96 4796	Ah	0	2	s	-	-	-	-			20	1	0	21		-	-	abundant	fine	-		O.HR
96 4796	BC	2	24	s	-	-	single grain	-			7	0	0	7		-	-	few	fine	-		O.HR
96 4796	C1	24	34	s	-	-	single grain	-			5	0	0	5		-	-	few	fine	-		O.HR
96 4796	C2	34	61		-	-	single grain	-			35	0	0	35		-	-	-	-	-		O.HR
96 4796	C3	61	122	s	-	-	single grain	-			10	0	0	10		-	-	-	-	-		O.HR
96 4798	Of	17	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 4798	Bgj	0	4	sicl	-	-	massive	-	2.5Y 4/2							-	-	few	fine	-		GL.SC
96 4798	Bg	4	57	sicl	-	-	massive	-	5Y 4/2							-	-	-	-	-		GL.SC
96 4798	Ofy	51	57		-	-	-	-								-	-	-	-	-		GL.SC
96 4798	BCz	57+			-	-	-	-								-	-	-	-	-		GL.SC
96 4799	F	5	0		-	-	-	-								-	-	abundant	fine	Permafrost	24	BR.SC
96 4799	Bm	0	24	sil	-	medium	platy	-	10YR 4/2							-	-	abundant	fine	Permafrost	24	BR.SC
96 4799	Bz	24+			-	-	-	-								-	-	-	-	Permafrost	24	BR.SC
96 4801	C1	0	18	s	-	-	single grain	-			30	25	10	65		-	-	abundant	fine	-		O.R
96 4801	C2	18	60	s	-	-	-	-			30	10	0	40		-	-	-	-	-		O.R
96 4802	F	1	0		-	-	-	-								-	-	abundant	medium	-		TC
96 4802	Ahe	0	11	s	-	very fine	granular	-	10YR 6/1		15	5	0	20		-	-	abundant	fine	-		TC
96 4802	Bfy	11	29	s	-	-	-	-	10YR 3/6		15	5	5	25		-	-	few	fine	-		TC
96 4802	Cy	23	112	s	-	-	single grain	-	10YR 6/4		10	25	15	50		-	-	-	-	-		TC
96 4808	LFH	4	0		-	-	-	-								-	-	abundant	medium	Permafrost	34	GL.TC
96 4808	Bm	0	8	sicl	-	fine	granular	-	2.5Y 4/2		1	0	0	1		-	-	abundant	fine	Permafrost	34	GL.TC
96 4808	Bmgjy	8	30	l	-	medium	platy	-	2.5Y 4/2		2	0	0	2		-	-	abundant	fine	Permafrost	34	GL.TC
96 4808	Bgj	17	34	fsl	-	-	massive	-	5Y 4/2							-	-	few	fine	Permafrost	34	GL.TC
96 4808	Cg	20	34	fsl	-	-	massive	-	5Y 5/2							-	-	few	fine	Permafrost	34	GL.TC
96 4808	Cz	34+			-	-	-	-								-	-	-	-	Permafrost	34	GL.TC
96 6607	F	3	0		-	-	-	-								-	-	plentiful	medium	-		R.TC
96 6607	Bm	0	25	s	-	-	single grain	-	10YR 4/4		6	2	0	8		-	-	few	fine	-		R.TC
96 6607	Bmy	25	61	s	-	-	single grain	-	10YR 4/3		11	4	0	15		-	-	-	fine	-		R.TC
96 6607	Cz	71			-	-	single grain	-								-	-	-	-	-		R.TC
96 6608	Of	22	0		-	-	-	-								-	-	abundant	fine	Water	6	BR.SC
96 6608	Ah	0	1		-	-	massive	-								-	-	plentiful	fine	Water	6	BR.SC
96 6608	Bmgj	1	6	sicl	-	-	massive	-	2.5Y 4/2							-	-	plentiful	fine	Water	6	BR.SC
96 6608	Bmg	6	16	sicl	-	-	massive	-	10YR 4/1							-	-	few	fine	Water	6	BR.SC
96 6608	Cgy	16	20	sil	-	-	massive	-	10YR 4/1							-	-	few	fine	Water	6	BR.SC
96 6608	Cz	20+			-	-	-	-								-	-	-	-	Water	6	BR.SC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction			Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Type	Depth	
96 6706	H	1	0		-	-	-	-								-	-	abundant	medium	K	3		O.R
96 6706	Bm	0	3	s	-	-	single grain	-	10YR 5/2		10	5	0	15		-	-	few	-	K	3		O.R
96 6706	C	3	38+	s	-	-	massive	-	2.5Y 5/2		14	6	0	20		-	-	-	-	K	3		O.R
96 6707	H	4	0		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 6707	Ahj	0	5	sl	-	-	single grain	-			20	20	0	40		-	-	abundant	fine	-			BR.SC
96 6707	Bm	0	26	ls	-	-	single grain	-	10YR 5/4		15	25	0	40		-	-	few	fine	-			BR.SC
96 6707	C	26	83	s	-	-	single grain	-	10YR 6/2		20	30	15	65		-	-	-	-	-			BR.SC
96 6707	Cz	83+			-	-	-	-								-	-	-	-	-			BR.SC
96 6709	LFH	20	19		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 6709	Of1	19	0		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 6709	Bmgy	0	32	sil	-	medium	granular	-	10YR 4/1							-	-	few	fine	-			BR.SC
96 6709	Cz	32+			-	-	-	-								-	-	-	-	-			BR.SC
96 6710	LFH	9	0		-	-	-	-								-	-	-	-	-			BR.SC
96 6710	Ah	0	7	s	-	-	single grain	-			50	5	0	55		-	-	abundant	fine	-			BR.SC
96 6710	Bm	17	30	s	-	-	single grain	-			55	5	0	60		-	-	-	-	-			BR.SC
96 6710	C	30	86	s	-	-	single grain	-			70	5	0	75		-	-	-	-	-			BR.SC
96 6710	Cz	86+			-	-	-	-								-	-	-	-	-			BR.SC
96 6711	Of	13	9		-	-	-	-								-	-	abundant	fine	Permafrost	25		GL.TC
96 6711	Om	9	0		-	-	-	-								-	-	abundant	fine	Permafrost	25		GL.TC
96 6711	Bgy	0	25	sicl	-	-	-	-	5Y 6/2		0	5	0	5		-	-	few	fine	Permafrost	25		GL.TC
96 6711	Bz	25+			-	-	-	-								-	-	-	-	Permafrost	25		GL.TC
96 6712	Of	28	0		-	-	-	-								-	-	abundant	fine	Water	0		GL.SC
96 6712	Bg1	0	4	s	-	-	massive	-	2.5Y 5/2		10	0	0	10		-	-	abundant	fine	Water	0		GL.SC
96 6712	Bg2	4	32	fsl	-	-	massive	-	5Y 4/1		0	0	0	0		-	-	-	-	Water	0		GL.SC
96 17329	LFH	2	0		-	-	-	-								-	-	abundant	medium	L	14		O.DYB
96 17329	Ah	0	4		-	-	single grain	-	10YR 2/1		1	0	0	1		-	-	abundant	fine	L	14		O.DYB
96 17329	Bm	4	11		-	-	single grain	-	10YR 2/2		2	0	0	2		-	-	plentiful	fine	L	14		O.DYB
96 17329	R	11+			-	-	-	-			95	0	0	95		-	-	few	fine	L	14		O.DYB
96 17330	Of	12	0		-	-	-	-								-	-	plentiful	fine	-			GL.TC
96 17330	Bcgy	0	38	sicl	-	coarse	subangular blocky	-	5Y 3/1		1	0	5	6		-	-	plentiful	fine	-			GL.TC
96 17330	Cgy	38	53	sicl	-	coarse	subangular blocky	-	5Y 3/1		1	0	10	11		-	-	-	-	-			GL.TC
96 17330	Cz	53+			-	-	-	-								-	-	-	-	-			GL.TC
96 17331	F	3	0		-	-	-	-								-	-	abundant	fine	-			GL.TC
96 17331	Bgy	0	39	sicl	-	-	subangular blocky	-	5Y 4/2							-	-	plentiful	fine	-			GL.TC
96 17331	BCz	39+			-	-	-	-								-	-	-	-	-			GL.TC
96 17332	F	5	0		-	-	-	-								-	-	abundant	fine	Permafrost	40		O.SC
96 17332	Bm	0	5	si	-	fine	subangular blocky	-	10YR 4/2							-	-	abundant	fine	Permafrost	40		O.TC
96 17332	BC	5	11	sicl	-	fine	angular blocky	-	10YR 5/2							-	-	few	fine	Permafrost	40		O.TC
96 17332	Bgyj	11	51	sicl	-	medium	angular blocky	-	10YR 5/2							-	-	few	fine	Permafrost	40		O.TC
96 17333	Of	40	0		-	-	-	-								-	-	plentiful	fine	Permafrost	40		FI.OC
96 17333	Cz	40+			-	-	-	-								-	-	-	-	Permafrost	40		FI.OC
96 17334	F	15	18		-	-	-	-								-	-	abundant	fine	Permafrost	45		BR.SC
96 17334	H	8	0		-	-	-	-								-	-	plentiful	medium	Permafrost	45		BR.SC
96 17334	Ah	8	15		-	fine	granular	-	10YR 2/1		5	0	0	5		-	-	plentiful	medium	Permafrost	45		BR.SC
96 17334	Bm1	15	41		-	fine	subangular blocky	-	10YR 4/3		5	2	10	17		-	-	few	fine	Permafrost	45		BR.SC
96 17334	B/C	41	45		-	fine	granular	-	5Y3/2		0	5	10	15		-	-	-	-	Permafrost	45		BR.SC
96 17334	Cz	45+			-	-	-	-								-	-	-	-	Permafrost	45		BR.SC
96 17335	F	2	0		-	-	-	-								-	-	abundant	medium	Permafrost	45		BR.SC
96 17335	BC	0	5	cl	-	-	subangular blocky	-	2.5Y 4/2		2	0	0	2		-	-	abundant	medium	Permafrost	45		BR.SC
96 17335	C	5	32	cl	-	-	massive	-	2.5Y 4/3		2	0	0	2		-	-	few	fine	Permafrost	45		BR.SC
96 17335	Cg	32	45	sicl	-	-	massive	-	10Y 5/1							-	-	few	fine	Permafrost	45		BR.SC
96 17336	Bg	0	6	sicl	-	medium	granular	-	10Y 4/1		1	0	0	1		-	-	plentiful	fine	Permafrost	40		GL.TC
96 17336	Of	19	0		-	-	-	-								-	-	plentiful	medium	Permafrost	40		GL.TC
96 17336	Ohy	6	20		-	-	-	-								-	-	plentiful	fine	Permafrost	40		GL.TC
96 17339	Cg1	0	25	sl	-	-	single grain	-	5Y 4/1		5	0	0	5		-	-	few	fine	-			R.G
96 17339	Cg2	25	50	scl	-	-	single grain	-	5GY 4/1		1	1	0	2		-	-	-	-	-			R.G
96 17339	Cg3	50+		sc	-	-	massive	-	5GY 4/1		0	1	0	1		-	-	-	-	-			R.G

Appendix 2b. Soils Data

		Depth		Texture	Structure			Aspect		Colour		Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
Site ID	Horizon Classification	Top (cm)	Bottom (cm)		Grade	Size	Kind					Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
96 17340	LFH	1	0		-	-	-	-								-	-	abundant	fine	Water	1	O.R		
96 17340	C1	0	18	s	-	-	-	-								-	-	few	fine	Water	1	O.R		
96 17340	C2	18	100+	s	-	-	-	-								-	-	-	-	Water	1	O.R		
96 17341	Bg	0	35	sil	-	-	-	-	2.5Y 5/2			0	0	0	0	-	-	abundant	fine	-		GL.SC		
96 17341	Cg1	35	70	sicl	-	-	-	-	2.5Y 4/2			2	0	0	2	-	-	few	fine	-		GL.SC		
96 17341	Cg2	35	86	s	-	-	-	-				10	0	0	10	-	-	few	fine	-		GL.SC		
96 17341	Cz	86+			-	-	-	-								-	-	-	-	-		GL.SC		
96 17342	F	7	0		-	-	-	-								-	-	abundant	medium	-		O.R		
96 17342	Ah	0	21	s	-	-	single grain	-	10YR 2/1			35	10	0	45	-	-	abundant	medium	-		O.R		
96 17342	BC	21	42		-	-	single grain	-	10YR 6/2			35	15	0	50	-	-	few	fine	-		O.R		
96 17342	C	47+			-	-	single grain	-	10YR 6/2			25	0	0	25	-	-	-	fine	-		O.R		
96 17343	F	1	0		-	-	-	-								-	-	abundant	fine	-		BR.SC		
96 17343	Ah	0	2		-	-	granular	-	2.5Y 5/2			0	0	0	0	-	-	few	coarse	-		BR.SC		
96 17343	Bm	2	47		-	-	subangular blocky	-	2.5Y 5/3			1	0	0	1	-	-	few	fine	-		BR.SC		
96 17343	C	47	81		-	-	subangular blocky	-	2.5Y 5/3							-	-	-	-	-		BR.SC		
96 17343	Cz	81+			-	-	-	-								-	-	-	-	-		BR.SC		
96 17344	LFH	7	0		-	-	-	-								-	-	abundant	fine	-		O.HR		
96 17344	Aej	0	15		-	-	single grain	-				10	0	0	10	-	-	plentiful	fine	-		O.HR		
96 17344	Bm	15	19		-	-	single grain	-				5	0	0	5	-	-	few	fine	-		O.HR		
96 17344	C	19	107+		-	-	single grain	-				30	2	0	32	-	-	-	-	-		O.HR		
96 17345	Of	3	0		-	-	-	-								-	-	abundant	fine	Permafrost	35	GL.SC		
96 17345	B/Cg	0	35	I	-	-	massive	-	2.5Y 5/3							-	-	plentiful	fine	Permafrost	35	GL.SC		
96 17345	Cg	33	35	I	-	-	massive	-	5Y 4/2							-	-	plentiful	fine	Permafrost	35	GL.SC		
96 17345	Ofy	33	35		-	-	-	-								-	-	abundant	fine	Permafrost	35	GL.SC		
96 17345	Cz	35+			-	-	-	-								-	-	-	-	Permafrost	35	GL.SC		
96 17346	Of	7	0		-	-	-	-								-	-	abundant	fine	-		BR.SC		
96 17346	Bm	0	21		-	-	granular	-	10YR 3/2							-	-	plentiful	fine	-		BR.SC		
96 17346	IIC	21	23		-	-	-	-								-	-	-	-	-		BR.SC		
96 17346	BC	23	44		-	medium	platy	-	10YR 4/3							-	-	few	fine	-		BR.SC		
96 17346	Cz	44+			-	-	-	-								-	-	-	-	-		BR.SC		
96 17347	Of	4	0		-	-	-	-								-	-	plentiful	fine	-		GL.SC		
96 17347	Cg1	0	43		-	fine	angular blocky	-	2.5Y 4/2							-	-	few	fine	-		GL.SC		
96 17347	Cg2	43	54		-	medium	angular blocky	-	10Y 4/1							-	-	-	-	-		GL.SC		
96 17347	Cz	54+			-	-	-	-								-	-	-	-	-		GL.SC		
96 17348	Of	15	0		-	-	-	-								-	-	abundant	fine	-		GL.SC		
96 17348	Ah	0	17	sil	-	very fine	granular	-	2.5Y 3/2			0	0	0	0	-	-	-	-	-		GL.SC		
96 17348	BC	0	32	sil	-	fine	subangular blocky	-	2.5Y 4/2			0	0	0	0	-	-	plentiful	fine	-		GL.SC		
96 17348	Cg	32	37	ls	-	-	single grain	-	2.5Y 5/2			0	0	0	0	-	-	few	fine	-		GL.SC		
96 17348	Cz	37+			-	-	-	-								-	-	-	-	-		GL.SC		
96 17349	F	2	0		-	-	-	-								-	-	abundant	fine	Permafrost	39	B.TC		
96 17349	Ah	0	9	fsl	-	-	-	-	10YR 4/3							-	-	abundant	fine	Permafrost	39	B.TC		
96 17349	Bm	9	39	fsl	-	medium	subangular blocky	-	2.5Y 5/6							-	-	few	fine	Permafrost	39	B.TC		
96 17349	Ahy	22	37	I	-	fine	subangular blocky	-	10YR 4/3							-	-	few	fine	Permafrost	39	B.TC		
96 17349	Cz	39+			-	-	-	-								-	-	-	-	Permafrost	39	B.TC		
96 17350	Bhg	0	14	fsl	-	fine	granular	-	10YR 5/3							-	-	abundant	medium	-		GL.SC		
96 17350	Bg	14	54	sil	-	fine	granular	-	10YR 6/2							-	-	abundant	fine	-		GL.SC		
96 17350	Cz	54+			-	-	-	-								-	-	-	-	-		GL.SC		
96 17351	H	2	0		-	-	-	-								-	-	abundant	fine	-		GL.SC		
96 17351	Bmgj	0	53	ls	-	fine	granular	-	10YR 5/3			5	10	5	20	-	-	abundant	fine	-		GL.SC		
96 17351	BC	53	61	ls	-	-	single grain	-	2.5Y 5/2			5	20	5	30	-	-	few	fine	-		GL.SC		
96 17351	C	61	94	sl	-	-	single grain	-	2.5Y 6/2							-	-	-	-	-		GL.SC		
96 17352	F	3	0		-	-	-	-								-	-	abundant	fine	-		O.R		
96 17352	Ahj	0	2	sl	-	fine	single grain	-	7.5YR 3/2			10	0	0	10	-	-	plentiful	fine	-		O.R		
96 17352	Bhj	2	6	ls	-	-	granular	-	10YR 5/4			12	3	0	15	-	-	few	fine	-		O.R		
96 17352	C1	6	151	sl	-	-	granular	-	10YR 6/2			10	15	10	35	-	-	few	fine	-		O.R		
96 17352	C2	151+			-	-	-	-								-	-	-	-	-		O.R		
96 17353	LFH	8	0		-	-	-	-								-	-	-	-	-		GL.TC		

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction			Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Type	Depth	
96 17353	Ahe	0	8	ls	-	-	single grain	-	10YR 5/3							-	-	plentiful	fine	-			GL.TC
96 17353	Bhj	8	16	ls	-	-	single grain	-	7.5YR 3/2							-	-	few	fine	-			GL.TC
96 17353	Bmgy	8	63	ls	-	-	single grain	-	10YR 5/4							-	-	few	fine	-			GL.TC
96 17353	Cgj	63	74	ls	-	-	single grain	-								-	-	few	fine	-			GL.TC
96 17353	Cz	74+			-	-	-	-								-	-	-	-	-			GL.TC
96 17354	H	8	0		-	-	-	-								-	-	abundant	fine	L	20		O.HR
96 17354	Ah	0	20	ls	-	fine	granular	-	10YR 3/3							-	-	few	fine	L	20		O.HR
96 17354	R	20+			-	-	-	-								-	-	-	-	L	20		O.HR
96 17355	Bmgj	0	12	ls	-	-	single grain	-	10YR 5/3					1		-	-	abundant	fine	-			GL.SC
96 17355	Cg1	15	32	sl	-	-	single grain	-	10YR 3/1					1		-	-	few	fine	-			GL.SC
96 17355	BCg	53	72	cl	-	fine	granular	-	2.5Y 4/1					1		-	-	few	fine	-			GL.SC
96 17355	Cg2	72	88	sicl	-	-	massive	-	4N					0		-	-	-	-	-			GL.SC
96 17355	Bg	12	53	sicl	-	-	-	-	10YR 4/3					1		-	-	-	-	-			GL.SC
96 17355	Cz	88+			-	-	-	-								-	-	-	-	-			GL.SC
96 17356	Om	2	0		-	-	-	-								-	-	abundant	fine	Permafrost	35		R.SC
96 17356	Bmg	0	4	cl	-	-	massive	-	2.5Y 5/3							-	-	plentiful	fine	Permafrost	35		R.SC
96 17356	B/Cg	4	35	cl	-	-	massive	-	5Y 5/2							-	-	few	fine	Permafrost	35		R.SC
96 17356	Cz	35+			-	-	-	-								-	-	-	-	Permafrost	35		R.SC
96 17358	Bm	0	12	ls	-	-	single grain	-			20	10	0	30		-	-	abundant	fine	-			O.DYB
96 17358	C	12	145	s	-	-	single grain	-			20	2	0	22		-	-	few	fine	-			O.DYB
96 17358	Cz	145+			-	-	-	-								-	-	-	-	-			O.DYB
96 17359	L	11	10		-	-	-	-								-	-	-	-	Permafrost	32		R.SC
96 17359	H	10	0		-	-	-	-								-	-	abundant	fine	Permafrost	32		R.SC
96 17359	Bm	0	5	cl	-	fine	subangular blocky	-	2.5Y 6/2		2	0	0	2		-	-	few	fine	Permafrost	32		R.SC
96 17359	BC	5	47	cl	-	fine	angular blocky	-	2.5Y 5/2							-	-	few	fine	Permafrost	32		R.SC
96 17359	Cg	47	50	cl	-	-	massive	-	2.5Y 4/2							-	-	few	fine	Permafrost	32		R.SC
96 17359	Cz	50+			-	-	-	-								-	-	-	-	Permafrost	32		R.SC
96 17359	Bh	0	14	sil	-	fine	single grain	-	10YR 3/1			0	5	5		-	-	-	-	Permafrost	32		R.SC
96 17359	Ah	14	29	sil	-	fine	single grain	-	7.5YR 3/1							-	-	plentiful	fine	Permafrost	32		R.SC
96 17359	BC	18	24	cl	-	fine	angular blocky	-	2.5Y 5/2							-	-	few	fine	Permafrost	32		R.SC
96 17359	Cg	29	32	cl	-	-	-	-	2.5Y 4/1							-	-	few	fine	Permafrost	32		R.SC
96 17359	Cz	32+			-	-	-	-								-	-	-	-	Permafrost	32		R.SC
96 17360	C	0	134	s	-	-	single grain	-						7		-	-	few	fine	-			O.R
96 17360	Cz	134+			-	-	-	-								-	-	-	-	-			O.R
96 17361	H	25	23		-	-	-	-								-	-	abundant	medium	-			BR.TC
96 17361	Of	23	0		-	-	-	-								-	-	abundant	fine	-			BR.TC
96 17361	Bm1	0	6	sicl	-	medium	granular	-	2.5Y 4/2							-	-	abundant	fine	-			BR.TC
96 17361	Bm2	2	37	sic	-	coarse	subangular blocky	-	2.5Y 4/3							-	-	few	fine	-			BR.TC
96 17361	Ahy1	0	43	sil	-	-	-	-	5Y 3/1							-	-	abundant	fine	-			BR.TC
96 17361	Ahy2	41	43	sil	-	-	single grain	-	2.5Y 3/1							-	-	plentiful	fine	-			BR.TC
96 17361	Cgy	43	45	sil	-	-	-	-	10Y 5/1							-	-	-	-	-			BR.TC
96 17361	Cz	25	45+		-	-	-	-								-	-	-	-	-			BR.TC
96 17362	F	2	0		-	-	-	-								-	-	abundant	fine	-			GL.SC
96 17362	Bmgj	0	4	sil	-	coarse	granular	-	2.5Y 5/2		1	2	0	3		-	-	few	fine	-			GL.SC
96 17362	Bg	4	60	cl	-	medium	platy	-	2.5Y 4/2		1	2	0	3		-	-	few	fine	-			GL.SC
96 17362	Ahy	53	58	sil	-	fine	platy	-	2.5Y 3/1							-	-	abundant	fine	-			GL.SC
96 17362	Cz	60+			-	-	-	-								-	-	-	-	-			GL.SC
96 17363	Of	6	0		-	-	-	-								-	-	abundant	fine	-			GL.SC
96 17363	Cg1	0	5	sil	-	-	single grain	-	2.5Y 4/2		1	0	0	1		-	-	plentiful	fine	-			GL.SC
96 17363	Cg2	5	73	sil	-	fine	subangular blocky	-	2.5Y 3/2		2	1	0	3		-	-	few	fine	-			GL.SC
96 17363	Cg3	73	82	sicl	-	-	massive	-	10Y 4/1			0	0	5		-	-	-	-	-			GL.SC
96 17363	Cz	82+			-	-	-	-								-	-	-	-	-			GL.SC
96 17364	Of	4	0		-	-	-	-								-	-	abundant	fine	-			GL.SC
96 17364	Bg	0	45	s	-	-	single grain	-			2	0	2	4		-	-	abundant	fine	-			GL.SC
96 17364	Cg	45	88	scl	-	fine	subangular blocky	-	2.5Y 4/1		2	0	0	2		-	-	few	fine	-			GL.SC
96 17364	Cz	88+			-	-	-	-								-	-	-	-	-			GL.SC
96 17365	C	0	130	s	-	-	single grain	-								-	-	plentiful	fine	-			O.R

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
96 17365	Cz	130+			-	-	-	-								-	-	-	-	-		O.R
96 17366	F	5	0		-	-	-	-								-	-	abundant	fine	-		O.DYB
96 17366	Bm1	0	16	sl	-	-	-	-	10YR 6/3							-	-	abundant	fine	-		O.DYB
96 17366	Gravel / Cobble	16	31		-	-	-	-			10	20	15	45		-	-	-	-	-		O.DYB
96 17366		31	54+	ls	-	-	-	-	10YR 5/3		45	15	0	60		-	-	few	fine	-		O.DYB
96 17367	Om	0	17		-	-	-	-								-	-	abundant	fine	Permafrost	46	ME.OC
96 17367	Ohg	17	46		-	-	-	-								-	-	abundant	fine	Permafrost	46	ME.OC
96 17367	Ohz	46+			-	-	-	-								-	-	-	-	Permafrost	46	ME.OC
96 17368	Of	28	0		-	-	-	-								-	-	abundant	medium	Permafrost	28	FI.OC
96 17368	Om	17	14		-	-	-	-								-	-	abundant	fine	Permafrost	28	FI.OC
96 17368	Ofz	0+			-	-	-	-								-	-	-	-	Permafrost	28	FI.OC
96 17369	Bm1	0	23	fsl	-	fine	platy	-	10YR 5/3							-	-	plentiful	medium	Permafrost	45	GL.SC
96 17369	Bm2	23	45	sil	-	fine	granular	-	10YR 5/3							-	-	plentiful	fine	Permafrost	45	GL.SC
96 17369	Cg	45	53	sicl	-	-	massive	-	10YR 5/2							-	-	-	-	Permafrost	45	GL.SC
96 17369	Cz	53+			-	-	-	-								-	-	-	-	Permafrost	45	GL.SC
96 17370	L	1	0		-	-	-	-								-	-	-	-	-		BR.SC
96 17370	Bm	0	75	fsl	-	-	single grain	-								-	-	plentiful	fine	-		BR.SC
96 17370	Cz	75+			-	-	-	-								-	-	-	-	-		BR.SC
96 17371	Of	14	0		-	-	-	-								-	-	abundant	fine	Permafrost	31	R.SC
96 17371	C	0	31	fsl	-	-	single grain	-								-	-	few	fine	Permafrost	31	R.SC
96 17371	Cz	31+			-	-	-	-								-	-	-	-	Permafrost	31	R.SC
96 17372	Of	29	0		-	-	-	-								-	-	abundant	fine	Permafrost	26	GL.SC
96 17372	Cg	0	26	sicl	-	fine	subangular blocky	-	10Y 5/1							-	-	few	fine	Permafrost	26	GL.SC
96 17372	Cz	26+			-	-	-	-								-	-	-	-	Permafrost	26	GL.SC
96 17373	Of	31	0		-	-	-	-								-	-	plentiful	fine	Permafrost	43	GL.SC
96 17373	Cg	0	43	sicl	-	fine	angular blocky	-	5Y5/2							-	-	few	fine	Permafrost	43	GL.SC
96 17373	Cz	43+			-	-	-	-								-	-	-	-	Permafrost	43	GL.SC
96 17374	Of	35	0		-	-	-	-								-	-	abundant	fine	Permafrost	35	TFI.OC
96 17374	Cz	35+			-	-	-	-								-	-	-	-	Permafrost	35	TFI.OC
96 17375	Of	24	0		-	-	-	-								-	-	abundant	fine	Water	5	GL.SC
96 17375	Cg	0	17	c	-	-	massive	-	5GY 4/1							-	-	plentiful	fine	Water	5	GL.SC
96 17375	Cz	17+			-	-	-	-								-	-	-	-	Water	5	GL.SC
96 17376	Ah	0	11	s	-	-	single grain	-			40	30	20	90		-	-	few	fine	-		O.HR
96 17376	C	11	70+	s	-	-	single grain	-			30	30	30	90		-	-	few	fine	-		O.HR
96 17377	C1	0	1	ls	-	-	single grain	-								-	-	abundant	fine	-		GL.R
96 17377	C2	1	11	s	-	-	single grain	-								-	-	abundant	fine	-		GL.R
96 17377	Cg	11	97+	c	-	very fine	subangular blocky	-	2.5Y 4/1							-	-	plentiful	fine	-		GL.R
96 17378	C	0	17	s	-	-	single grain	-								-	-	abundant	fine	-		GL.SC
96 17378	Bgy	17	28	fsl	-	-	single grain	-								-	-	abundant	fine	-		GL.SC
96 17378	Cg	28	74	c	-	fine	subangular blocky	-	N4/1							-	-	-	-	-		GL.SC
96 17378	Cz	74+			-	-	-	-								-	-	-	-	-		GL.SC
96 17379	C1	0	12	s	-	-	single grain	-								-	-	abundant	fine	-		O.R
96 17379	C2	12	92+	c	-	fine	subangular blocky	-	10Y 4/1		0	1	0	0		-	-	plentiful	fine	-		O.R
96 17380	Of1	19	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17380	Cg1	0	25	scl	-	medium	subangular blocky	-	2.5Y 4/2							-	-	abundant	fine	-		GL.TC
96 17380	Ofy	25	29		-	-	-	-								-	-	few	fine	-		GL.TC
96 17380	Cg2	29	35	scl	-	-	single grain	-	2.5Y 3/1		2	0	0	2		-	-	few	fine	-		GL.TC
96 17381	L	1.5	1		-	-	-	-								-	-	-	-	-		GLE.DYB
96 17381	F	1	0		-	-	-	-								-	-	few	medium	-		GLE.DYB
96 17381	Ahe	0	13	s	-	-	-	-			8	40	0	48		-	-	-	-	-		GLE.DYB
96 17381	Bm	2	25	s	-	-	-	-			15	2	0	17		-	-	-	-	-		GLE.DYB
96 17381	C	25	125	s	-	-	-	-			10	1	0	11		-	-	few	fine	-		GLE.DYB
96 17381	Cz	125+			-	-	-	-								-	-	-	-	-		GLE.DYB
96 17382	Of	15	0		-	-	-	-								-	-	abundant	fine	Permafrost	44	GL.SC
96 17382	Cg	0	29	scl	-	fine	subangular blocky	-	2.5Y 4/1		1	0	0	1		-	-	few	fine	Permafrost	44	GL.SC
96 17382	Cz	29+			-	-	-	-								-	-	-	-	Permafrost	44	GL.SC
96 17383	Om	8	4		-	-	-	-								-	-	abundant	fine	-		GL.SC

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Depth	
																				Type		
96 17383	Of	4	0		-	-	-	-								-	-	few	medium	-		GL.SC
96 17383	Bhg	0	24	sil	-	-	massive	-	10YR 4/2							-	-	abundant	fine	-		GL.SC
96 17383	Cg	24	47	sil	-	fine	angular blocky	-	2.5Y 4/2		1	0	0	1		-	-	few	fine	-		GL.SC
96 17383	Cz	47+			-	-	-	-								-	-	-	-	-		GL.SC
96 17384	Of1	23	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17384	Cg1	0	6	sl	-	-	single grain	-			25	0	0	25		-	-	abundant	fine	-		GL.SC
96 17384	Cg2	6	37	scl	-	fine	subangular blocky	-	2.5Y 3/2		6	0	0	6		-	-	few	fine	-		GL.SC
96 17384	Cg3	37	49	l	-	medium	subangular blocky	-	2.5Y 3/2		1	0	0	1		-	-	few	fine	-		GL.SC
96 17384	Of2	49	51		-	-	-	-								-	-	few	-	-		GL.SC
96 17384	Cz	51+			-	-	-	-								-	-	-	-	-		GL.SC
96 17385	Ah	0	17	s	-	fine	granular	-								-	-	plentiful	fine	-		BR.SC
96 17385	Bg	17	39	ls	-	fine	granular	-								-	-	plentiful	fine	-		BR.SC
96 17385	Cg	39	54	sl	-	medium	granular	-	2.5Y 5/3							-	-	few	fine	-		BR.SC
96 17385	Cz	54+			-	-	-	-								-	-	-	-	-		BR.SC
96 17386	F	4	0		-	-	-	-								-	-	plentiful	fine	-		R.SC
96 17386	Ae	0	2	s	-	-	single grain	-								-	-	plentiful	fine	-		R.SC
96 17386	C1	2	36	ls	-	-	single grain	-								-	-	plentiful	fine	-		R.SC
96 17386	C2	36	75	s	-	-	single grain	-								-	-	few	fine	-		R.SC
96 17386	Cz	75+			-	-	-	-								-	-	-	-	-		R.SC
96 17387	Ah	0	4	ls	-	-	-	-			1	0	0	1		-	-	abundant	fine	-		O.DBY
96 17387	Bm	4	18	s	-	-	-	-			3	1	0	4		-	-	plentiful	fine	-		O.DBY
96 17387	C	26	121+	s	-	-	-	-			30	5	1	36		-	-	few	fine	-		O.DBY
96 17388	Ah	0	0.5	s	-	-	single grain	-								-	-	plentiful	fine	C	0	O.HR
96 17388	C1	0.5	52	s	-	-	massive	-			35	2	0	37		-	-	-	-	C	0	O.HR
96 17388	C2	52	120+	s	-	-	massive	-			25	1	0	26		-	-	-	-	C	0	O.HR
96 17389	Of	32	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
96 17389	Bm1	0	7	sicl	-	medium	granular	-	2.5Y 5/3							-	-	abundant	fine	-		GL.TC
96 17389	B/Cgy	7	50	sicl	-	fine	angular blocky	-	2.5Y 5/3							-	-	plentiful	fine	-		GL.TC
96 17389	Cg	50	55	sicl	-	-	massive	-	2.5Y 3/2							-	-	few	fine	-		GL.TC
96 17390	LFH	6	0		-	-	-	-								-	-	plentiful	-	L	15	O.R
96 17390	C	0	15	s	-	-	single grain	-								-	-	plentiful	fine	L	15	O.R
96 17390	R	15+			-	-	-	-								-	-	-	-	L	15	O.R
96 17391	F	2	0		-	-	-	-								-	-	abundant	fine	-		O.HR
96 17391	Ah	0	1	s	-	-	single grain	-								-	-	abundant	fine	-		O.HR
96 17391	Ae	1	3	s	-	-	single grain	-			5	0	0	5		-	-	abundant	fine	-		O.HR
96 17391	C1	3	36	s	-	-	single grain	-			5	1	0	6		-	-	few	-	-		O.HR
96 17391	C2	36	101+	ls	-	-	single grain	-			40	2	0	42		-	-	-	-	-		O.HR
96 17392	Of	11	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17392	Cg1	0	41	scl	-	medium	granular	-	5Y 4/1		3	1	0	4		-	-	abundant	fine	-		GL.SC
96 17392	Cg2	41	50	cl	-	fine	subangular blocky	-	5Y 4/1		2	0	0	2		-	-	few	fine	-		GL.SC
96 17392	Cz	50+			-	-	-	-								-	-	-	-	-		GL.SC
96 17393	Of	15	6		-	-	-	-								-	-	abundant	fine	Permafrost	15	GL.SC
96 17393	Oh	6	0		-	-	-	-								-	-	abundant	fine	Permafrost	15	GL.SC
96 17393	Bm	0	15	sil	-	fine	subangular blocky	-	2.5Y 5/2							-	-	abundant	fine	Permafrost	15	GL.SC
96 17393	Bgj	15	25	sicl	-	fine	subangular blocky	-	2.5Y 5/2							-	-	plentiful	fine	Permafrost	15	GL.SC
96 17393	Bg1	25	38	sicl	-	fine	subangular blocky	-	2.5Y 5/1							-	-	few	fine	Permafrost	15	GL.SC
96 17393	Bg2	38	45	sil	-	fine	subangular blocky	-	2.5Y 5/1							-	-	-	-	Permafrost	15	GL.SC
96 17393	Ofy	20+			-	-	-	-								-	-	-	-	Permafrost	15	GL.SC
96 17393	Bz	50+			-	-	-	-								-	-	-	-	Permafrost	15	GL.SC
96 17394	Ahe	0	6	s	-	-	single grain	-			50	0	0	50		-	-	abundant	fine	-		O.HR
96 17394	C	6	150+	s	-	-	single grain	-			70	0	0	70		-	-	abundant	fine	-		O.HR
96 17395	Of	12	0		-	-	-	-								-	-	abundant	fine	Permafrost	37	GL.SC
96 17395	Bgyj	0	19	sicl	-	-	massive	-	10YR 3/2							-	-	plentiful	fine	Permafrost	37	GL.SC
96 17395	Bg	19	25	sicl	-	-	massive	-	10YR 3/2							-	-	few	fine	Permafrost	37	GL.SC
96 17395	Cz	25+			-	-	-	-								-	-	-	-	Permafrost	37	GL.SC
96 17396	H	2	0		-	-	-	-								-	-	abundant	medium	L	45	E.DYB
96 17396	Ae	0	4	fsl	-	-	single grain	-	10YR 5/8							-	-	few	fine	L	45	E.DYB

Appendix 2b. Soils Data

Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction			Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction	Type	Depth	
96 17396	Bm1	4	18	fsl	-	-	single grain	-	10YR 5/6							-	-	few	fine	L	45		E.DYB
96 17396	Bm2	1	29	s	-	-	single grain	-			50	10	0	60		-	-	few	fine	L	45		E.DYB
96 17396	C	18	45	fsl	-	-	single grain	-	10YR 6/4							-	-	few	fine	L	45		E.DYB
96 17396	R	45+			-	-	-	-								-	-	-	-	L	45		E.DYB
96 17397	Of	12	6		-	-	-	-								-	-	abundant	medium	Permafrost	37		GL.SC
96 17397	Om	6	0		-	-	-	-								-	-	abundant	medium	Permafrost	37		GL.SC
96 17397	Bmgj	0	21		-	-	massive	-	10YR 6/2							-	-	abundant	fine	Permafrost	37		GL.SC
96 17397	Bg	21	25		-	-	massive	-	6-10Y							-	-	few	fine	Permafrost	37		GL.SC
96 17397	Cz	25+			-	-	-	-								-	-	-	-	Permafrost	37		GL.SC
96 17398	L	16	14		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17398	F	14	11		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17398	Of	11	5		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17398	Om	5	0		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17398	Bmgj	0	24	sil	-	coarse	angular blocky	-	2.5Y 5/3							-	-	few	fine	-			BR.SC
96 17398	Bmy	24	33	sil	-	fine	subangular blocky	-	2.5Y 3/1							-	-	plentiful	fine	-			BR.SC
96 17398	Ahgy	33	37	sil	-	-	massive	-	10YR 3/1							-	-	few	fine	-			BR.SC
96 17398	Cz	37+			-	-	-	-								-	-	-	-	-			BR.SC
96 17399	L	5	4		-	-	-	-								-	-	plentiful	fine	-			O.DYB
96 17399	F	4	1		-	-	-	-								-	-	abundant	fine	-			O.DYB
96 17399	H	1	0		-	-	-	-								-	-	abundant	fine	-			O.DYB
96 17399	Ah	0	4	ls	-	-	single grain	-			30	10	20	65		-	-	abundant	fine	-			O.DYB
96 17399	Bm	4	33	s	-	-	single grain	-			10	20	40	70		-	-	abundant	fine	-			O.DYB
96 17399	C1	33	43	s	-	-	single grain	-			5	0	0	5		-	-	-	-	-			O.DYB
96 17399	C2	43	65	s	-	-	single grain	-			10	0	0	10		-	-	-	-	-			O.DYB
96 17399	C3	65+			-	-	-	-								-	-	-	-	-			O.DYB
96 17400	Of1	33	0		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17400	Bmgj	0	10	sil	-	fine	subangular blocky	-	10YR 3/3							-	-	few	fine	-			BR.SC
96 17400	Ofy	10	12		-	-	-	-								-	-	abundant	fine	-			BR.SC
96 17400	Cz	12+			-	-	-	-								-	-	-	-	-			BR.SC
96 17401	L	3	2		-	-	-	-								-	-	-	-	-			O.HR
96 17401	H	2	0		-	-	-	-								-	-	-	-	-			O.HR
96 17401	Ae	0	2	s	-	-	single grain	-			33	0	0	33		-	-	abundant	fine	-			O.HR
96 17401	BC	2	11	s	-	-	single grain	-			33	0	0	33		-	-	abundant	fine	-			O.HR
96 17401	C	11	100+	s	-	-	single grain	-			47	0	0	47		-	-	abundant	fine	-			O.HR
96 17402	Of	14	0		-	-	-	-								-	-	abundant	fine	Permafrost	30		GL.SC
96 17402	Cgj	0	7	sil	-	fine	angular blocky	-	2.5Y 5/2							-	-	abundant	fine	Permafrost	30		GL.SC
96 17402	Bmy	7	12	sil	-	-	massive	-	2.5Y 4/2							-	-	abundant	fine	Permafrost	30		GL.SC
96 17402	Cz	12+			-	-	-	-								-	-	-	-	Permafrost	30		GL.SC
96 17403	L	18	14		-	-	-	-								-	-	-	-	Permafrost	41		BR.SC
96 17403	Of	14	0		-	-	-	-								-	-	abundant	fine	Permafrost	41		BR.SC
96 17403	Bm	0	9	sil	-	fine	granular	-	7.5YR 5/2							-	-	abundant	medium	Permafrost	41		BR.SC
96 17403	Bcy	9	38	sicl	-	fine	angular blocky	-	10YR 5/2							-	-	plentiful	fine	Permafrost	41		BR.SC
96 17403	Cz	38+			-	-	-	-								-	-	-	-	Permafrost	41		BR.SC
96 17404	Of	10	0		-	-	-	-								-	-	abundant	fine	Permafrost	36		BR.TC
96 17404	Bm	0	13	sil	-	fine	granular	-	7.5YR 4/2		4	0	0	4		-	-	abundant	fine	Permafrost	36		BR.TC
96 17404	BC	13	36	sicl	-	fine	subangular blocky	-	10YR 5/2							-	-	plentiful	fine	Permafrost	36		BR.TC
96 17404	Cz	36+			-	-	-	-								-	-	-	-	Permafrost	36		BR.TC
96 17405	L	29	5		-	-	-	-								-	-	abundant	fine	C	25		BR.TC
96 17405	Of	5	0		-	-	-	-								-	-	-	-	C	25		BR.TC
96 17405	Bm1	0	5	sil	-	fine	granular	-	10YR 6/2							-	-	abundant	fine	C	25		BR.TC
96 17405	Bm2	5	25	c	-	medium	platy	-	10YR 5/2							-	-	plentiful	fine	C	25		BR.TC
96 17405	C	25	62	c	-	medium	pr	-	10YR 5/2							-	-	-	-	C	25		BR.TC
96 17405	Cz	62+			-	-	-	-								-	-	-	-	C	25		BR.TC
96 17406	Bmg	0	39	sil	-	fine	subangular blocky	-	2.5Y 5/3							-	-	few	fine	-			GL.SC
96 17406	Cz	39+			-	-	-	-								-	-	-	-	-			GL.SC
96 17407	Of	5	0		-	-	-	-								-	-	abundant	fine	Permafrost	42		GL.SC
96 17407	Bgy	0	36	sicl	-	fine	subangular blocky	-	2.5Y 4/3							-	-	plentiful	fine	Permafrost	42		GL.SC

Appendix 2b. Soils Data

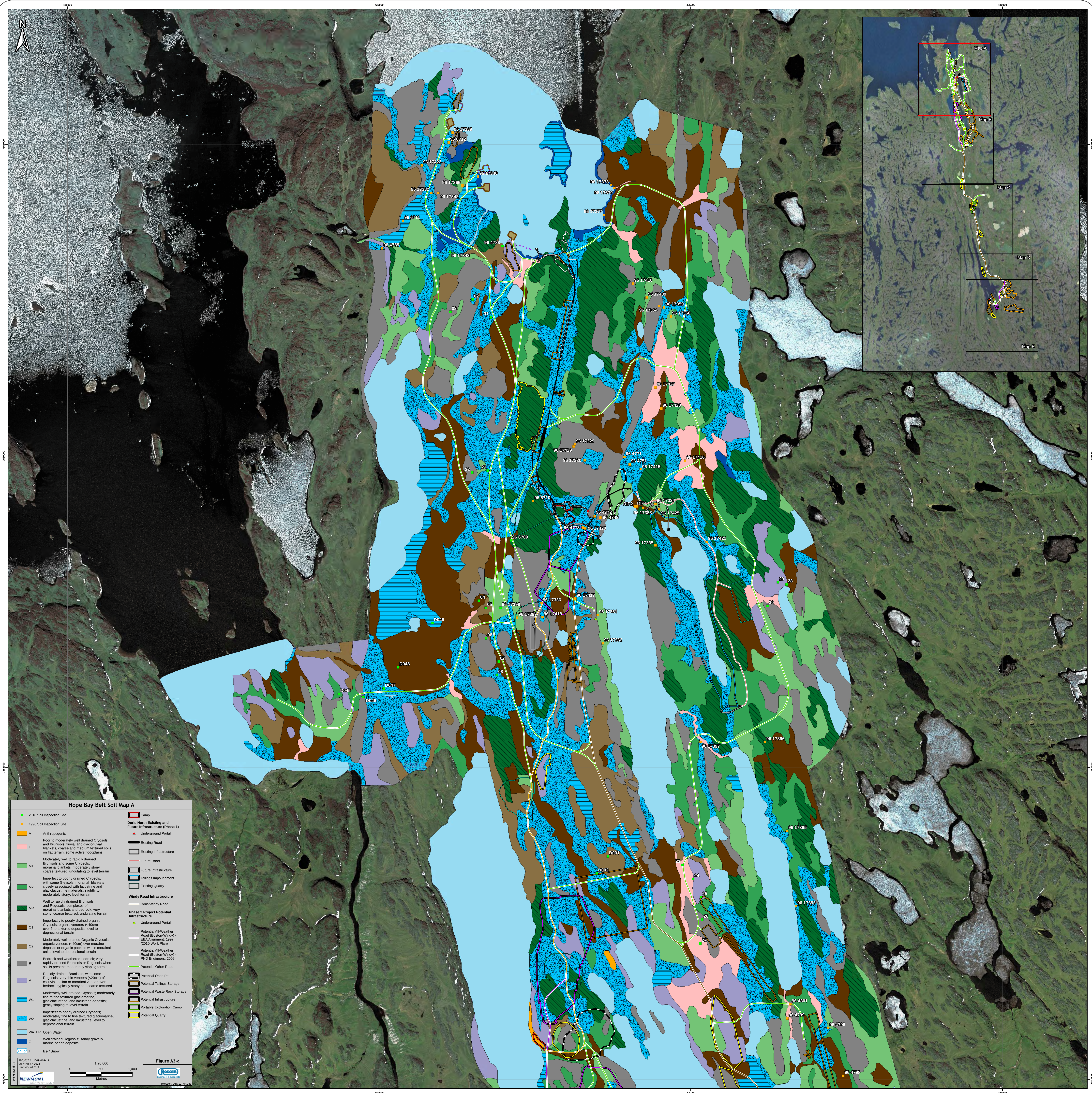
Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
96 17407	Cz	42+			-	-	-	-								-	-	-	-	Permafrost	42	GL.SC
96 17408	Of	20	0		-	-	-	-								-	-	abundant	fine	Permafrost	33	GL.SC
96 17408	Cg	0	13	c	-	-	massive	-	5GY 4/1							-	-	plentiful	fine	Permafrost	33	GL.SC
96 17408	Cz	13+			-	-	-	-								-	-	-	-	Permafrost	33	GL.SC
96 17409	Of	6	0		-	-	-	-								-	-	abundant	fine	-		R.SC
96 17409	C1	0	14	s	-	-	single grain	-								-	-	plentiful	fine	-		R.SC
96 17409	C2	14	70	s	-	-	single grain	-			5	2	3	10		-	-	few	fine	-		R.SC
96 17409	Cz	70+			-	-	-	-								-	-	-	-	-		R.SC
96 17410	F	0.5	0		-	-	-	-								-	-	plentiful	fine	-		BR.SC
96 17410	Ah	0	5	sl	-	fine	granular	-	10YR 3/2		1	0	1	2		-	-	abundant	fine	-		BR.SC
96 17410	Bm	5	31	s	-	very fine	granular	-			15	0	2	17		-	-	few	fine	-		BR.SC
96 17410	C	31	79	s	-	-	single grain	-			15	5	1	21		-	-	few	fine	-		BR.SC
96 17410	Cz	79+			-	-	-	-								-	-	-	-	-		BR.SC
96 17411	Of	7	0		-	-	-	-								-	-	abundant	fine	-		GL.BR
96 17411	Bmgj	0	41	l	-	medium	subangular blocky	-	10YR 4/2							-	-	few	fine	-		GL.BR
96 17411	C	11	44	fsl	-	-	massive	-	2.5Y 5/2							-	-	few	fine	-		GL.BR
96 17412	Of	16	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17412	Ah	0	2	sil	-	fine	granular	-	10YR 4/2							-	-	abundant	fine	-		GL.SC
96 17412	Bg	0	10	fsl	-	-	massive	-	5Y 5/2							-	-	few	fine	-		GL.SC
96 17412	BCg	10	24	fsl	-	-	massive	-	2.5Y 4/1							-	-	-	-	-		GL.SC
96 17412	Cz	24+			-	-	-	-								-	-	-	-	-		GL.SC
96 17413	H	2	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17413	Bm	0	3	sicl	-	coarse	granular	-	2.5Y 5/3							-	-	abundant	fine	-		GL.SC
96 17413	Bg	3	30	sil	-	-	massive	-	10YR 6/3							-	-	plentiful	fine	-		GL.SC
96 17413	Cg	30	33	fsl	-	-	single grain	-	5Y 6/1							-	-	-	-	-		GL.SC
96 17413	Cz	33+			-	-	-	-								-	-	-	-	-		GL.SC
96 17414	Of	17	0		-	-	-	-								-	-	abundant	fine	-		R.TC
96 17414	Bgy	0	24	sl	-	-	massive	-	2.5Y 4/2							-	-	few	fine	-		R.TC
96 17414	Ahy	22	24	sil	-	-	single grain	-	2.5Y 3/2							-	-	-	-	-		R.TC
96 17414	Cz	24+			-	-	-	-								-	-	-	-	-		R.TC
96 17415	H	18	0		-	-	-	-								-	-	few	fine	Permafrost	42	GL.SC
96 17415	Bmgj	2	22	s	-	very fine	granular	-	7.5YR 4/3							-	-	plentiful	fine	Permafrost	42	GL.SC
96 17415	Bg	22	39	sil	-	medium	granular	-	2.5Y 3/1		2	0	0	2		-	-	few	fine	Permafrost	42	GL.SC
96 17415	Cg	39	42	sicl	-	very fine	granular	-	2.5Y 5/1		25	0	0	25		-	-	few	fine	Permafrost	42	GL.SC
96 17415	Cz	42+			-	-	-	-								-	-	-	-	Permafrost	42	GL.SC
96 17416	Ah	0	2	s	-	very fine	granular	-			20	0	0	20		-	-	abundant	fine	-		O.HR
96 17416	C	2	100+	s	-	-	single grain	-			95	5	0	100		-	-	few	fine	-		O.HR
96 17417	Of	9	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
96 17417	Bm	0	3	sicl	-	medium	granular	-	2.5Y 5/3							-	-	plentiful	fine	-		GL.TC
96 17417	Bg	3	11	sil	-	very fine	subangular blocky	-	7.5YR 3/1							-	-	few	fine	-		GL.TC
96 17417	Bgy	11	16	sicl	-	medium	platy	-	2.5Y 6/2							-	-	few	-	-		GL.TC
96 17417	Cz	16+			-	-	-	-								-	-	-	-	-		GL.TC
96 17418	H	4	0		-	-	-	-								-	-	abundant	fine	-		BR.SC
96 17418	Bm	0	25	cl	-	fine	subangular blocky	-	2.5Y 4/3		5	0	0	5		-	-	few	fine	-		BR.SC
96 17418	Bmgj	25	40	l	-	medium	granular	-	10YR 3/2		5	0	0	5		-	-	few	fine	-		BR.SC
96 17418	Bhgj	40	46	sil	-	fine	granular	-	2.5YR 2.5/1		5	0	0	5		-	-	few	fine	-		BR.SC
96 17418	Cz	50+			-	-	-	-								-	-	-	-	-		BR.SC
96 17420	Of	20	0		-	-	-	-								-	-	abundant	fine	Water	20	GL.SC
96 17420	Cg	0	24	sil	-	-	single grain	-	6/10Y		1	0	0	1		-	-	few	fine	Water	20	GL.SC
96 17420	Ofy	24	30		-	-	-	-								-	-	few	fine	Water	20	GL.SC
96 17420	Cz	30+			-	-	-	-								-	-	-	-	Water	20	GL.SC
96 17421	Of	15	12		-	-	-	-								-	-	abundant	fine	Permafrost	25	GL.TC
96 17421	Oh	12	0		-	-	-	-								-	-	abundant	fine	Permafrost	25	GL.TC
96 17421	Bg	0	25		-	coarse	granular	-	2.5Y 4/2							-	-	abundant	fine	Permafrost	25	GL.TC
96 17421	Cz	25+			-	-	-	-								-	-	-	-	Permafrost	25	GL.TC
96 17423	Of	17	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
96 17423	Ahg	0	8	sil	-	fine	granular	-	2.5Y 3/1							-	-	plentiful	fine	-		GL.TC

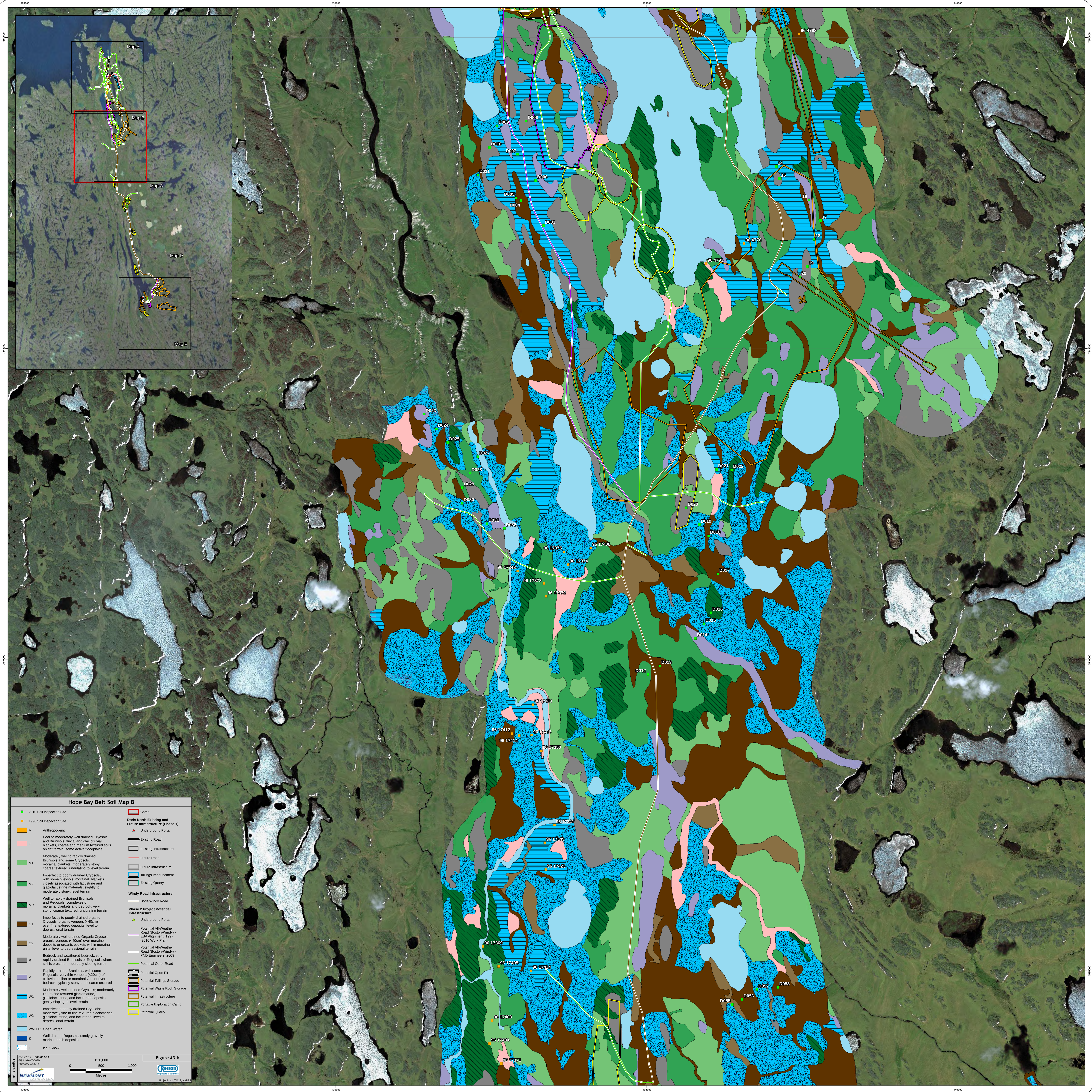
Appendix 2b. Soils Data

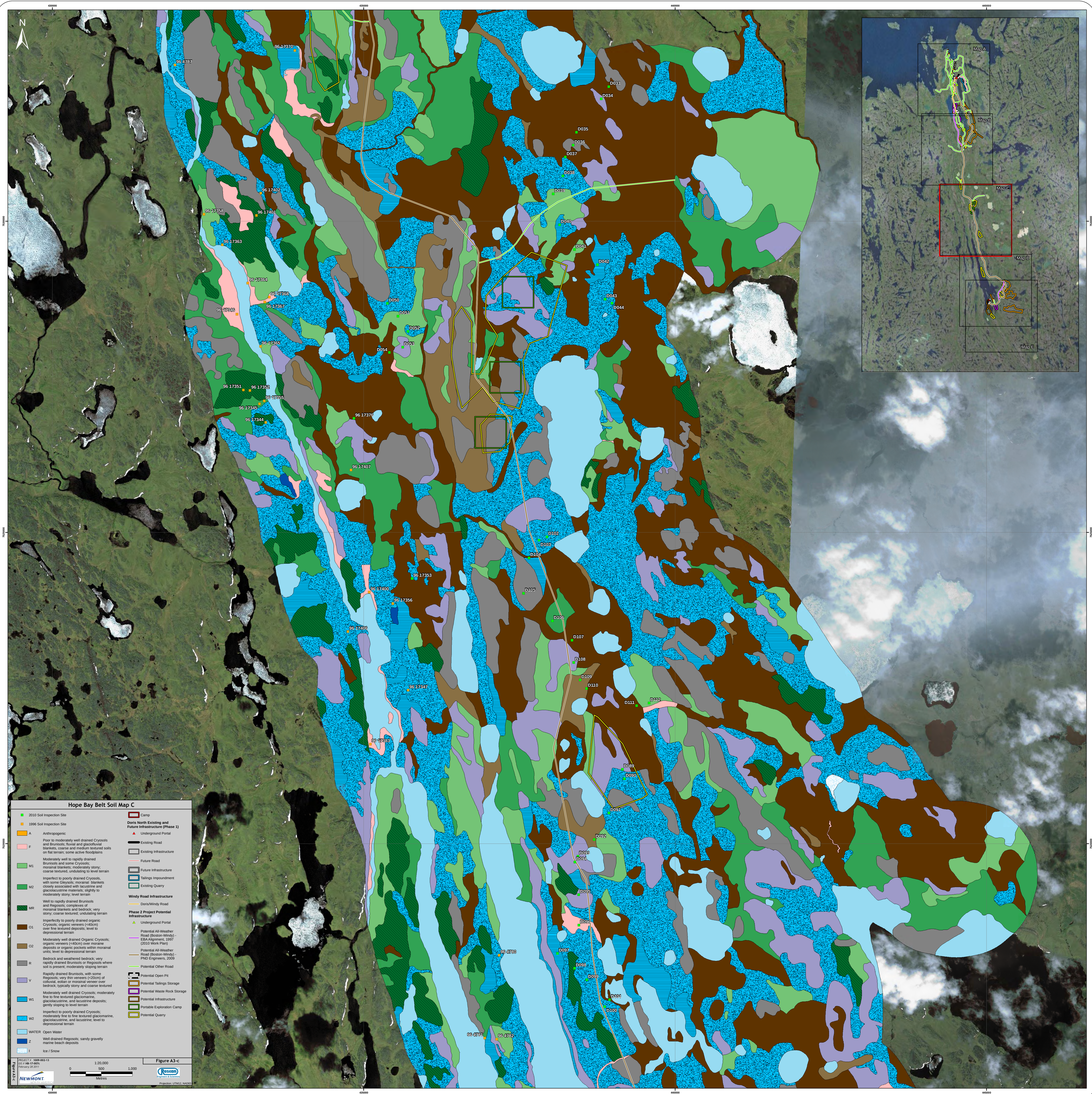
Site ID	Horizon Classification	Depth		Texture	Structure			Aspect	Colour	Coarse Fragment						Mottles		Roots		Root Restriction		Soil Classification
		Top (cm)	Bottom (cm)		Grade	Size	Kind			Pebbles (%)	Gravels (%)	Cobbles (%)	Boulders (%)	Total	Shape	Abundance	Size	Abundance	Size	Restriction Type	Depth	
96 17423	Ofy	8	12		-	-	-	-								-	-	-	-	-		GL.TC
96 17423	Cg	12	17	sicl	-	medium	subangular blocky	-	2.5Y 4/2							-	-	few	fine	-		GL.TC
96 17423	Cz	17+			-	-	-	-								-	-	-	-	-		GL.TC
96 17424	Of	2	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17424	Cg1	0	40	sicl	-	fine	subangular blocky	-	2.5Y 4/3							-	-	few	fine	-		GL.SC
96 17424	Cg2	40	48	sicl	-	coarse	subangular blocky	-	5Y4/2							-	-	-	-	-		GL.SC
96 17424	Cz	48+			-	-	-	-								-	-	-	-	-		GL.SC
96 17425	H	1	0		-	-	-	-								-	-	abundant	fine	-		O.DYB
96 17425	Ah	0	3	sil	-	fine	granular	-	10YR 3/1		1	0	0	1		-	-	abundant	fine	-		O.DYB
96 17425	Bm1	3	29	sl	-	coarse	granular	-	2.5Y 5/2		20	10	0	30		-	-	abundant	fine	-		O.DYB
96 17425	Bm2	29	76	ls	-	coarse	granular	-	2.5Y 5/2		25	10	0	35		-	-	-	-	-		O.DYB
96 17425	BC	76	100+	sl	-	medium	granular	-	2.5Y 5/2		20	20	0	40		-	-	-	-	-		O.DYB
96 17426	F	4	2		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17426	H	2	0		-	-	-	-								-	-	abundant	fine	-		GL.SC
96 17426	Bg	0	29	ls	-	vc	granular	-	10YR 6/3		25	15	0	40		-	-	-	-	-		GL.SC
96 17426	Cg	29	58	scl	-	-	single grain	-	10YR 7/2		40	10	0	50		-	-	few	fine	-		GL.SC
96 17426	Cz	58+			-	-	-	-								-	-	-	-	-		GL.SC
96 17427	L	1	1		-	-	-	-								-	-	-	-	-		R.SC
96 17427	F	1	0		-	-	-	-								-	-	abundant	fine	-		R.SC
96 17427	Ah	0	6	s	-	coarse	single grain	-	10YR 3/2		1	0	0	1		-	-	few	fine	-		R.SC
96 17427	BC	6	42	s	-	-	single grain	-	2.5Y 5/4		5	1	0	6		-	-	-	-	-		R.SC
96 17427	C	42	68	s	-	-	single grain	-	10YR 5/2		5	0	0	5		-	-	-	-	-		R.SC
96 17427	Cg	68	70	s	-	-	single grain	-	2.5Y 5/1							-	-	-	-	-		R.SC
96 17427	Cz	70+			-	-	-	-								-	-	-	-	-		R.SC
96 17428	Of	6	0		-	-	-	-								-	-	abundant	fine	-		GL.TC
96 17428	Bm	0	9	s	-	-	single grain	-	10YR 5/4							-	-	few	fine	-		GL.TC
96 17428	Bgj	9	18	s	-	-	single grain	-	2.5Y 5/2							-	-	few	fine	-		GL.TC
96 17428	Bg	18	32	sil	-	medium	subangular blocky	-	2.5Y 4/2							-	-	few	fine	-		GL.TC
96 17428	Cgy	32	67	sl	-	-	single grain	-	10Y 5/1							-	-	-	-	-		GL.TC
96 17428	Cz	67+			-	-	-	-								-	-	-	-	-		GL.TC
96 17429	Ahj	0	2	sl	-	fine	granular	-	2.5YR 2.5/1		10	0	0	10		-	-	few	fine	-		O.DYB
96 17429	Bm1	2	20	sl	-	fine	subangular blocky	-	10YR 3/2		5	0	0	5		-	-	few	fine	-		O.DYB
96 17429	Bm2	20	32	ls	-	coarse	granular	-	10YR 3/1		2	1	0	3		-	-	-	-	-		O.DYB
96 17429	R	32+			-	-	single grain	-			99	0	0	99		-	-	-	-	-		O.DYB

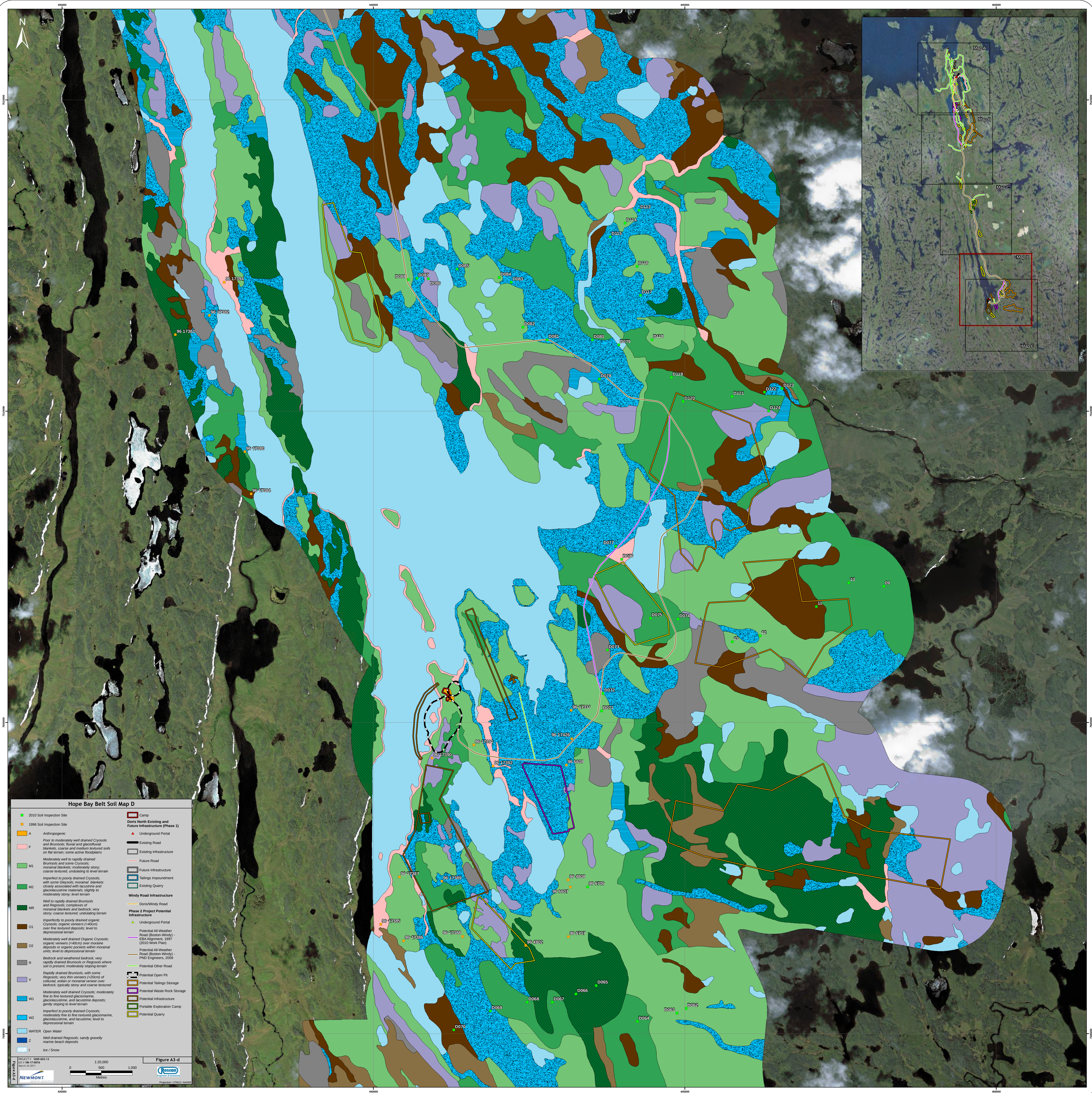
Appendix 3

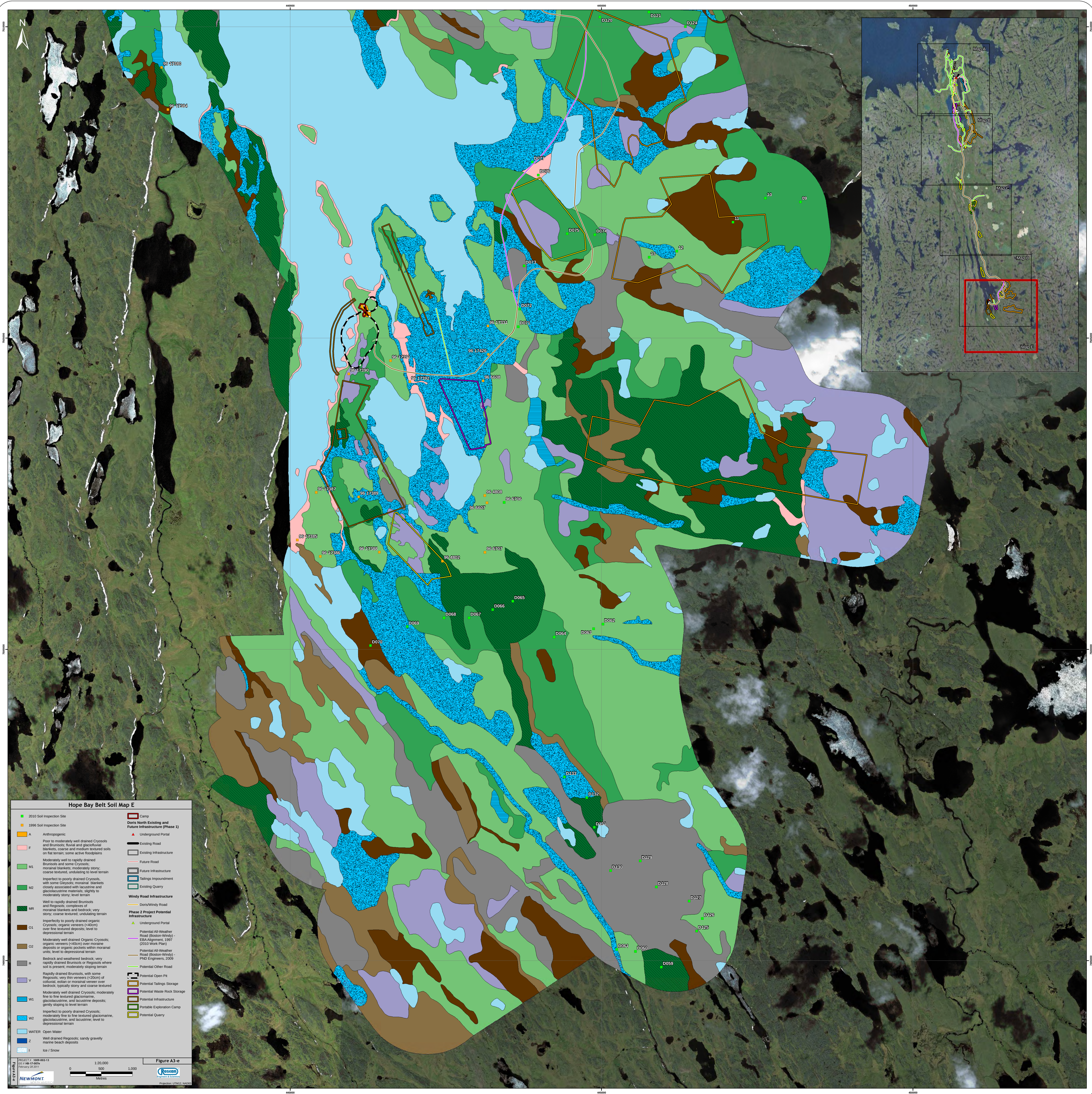
Soil Maps











Appendix 4

ALS Laboratory Results



RESCAN ENVIRONMENTAL SERVICES
ATTN: SUSAN AMES
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3
Phone: 604-689-9460

Date Received: 08-SEP-10
Report Date: 12-OCT-10 15:48 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L929006
Project P.O. #: NOT SUBMITTED
Job Reference:
Legal Site Desc:
C of C Numbers:

Comments:

Amber Springer
Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L929006-1	L929006-2	L929006-3	L929006-4	L929006-5
		Description					
		Sampled Date	15-AUG-10	15-AUG-10	15-AUG-10	15-AUG-10	16-AUG-10
		Sampled Time					
		Client ID	D06 (0-10)	D06 (10-20)	D10 (0-10)	D10 (10-20)	D20 (0-10)
Grouping	Analyte						
SOIL							
Physical Tests	pH (pH)		6.09	6.69	6.13	7.05	7.35
Organic / Inorganic Carbon	Total Organic Carbon (%)		1.36	0.71	0.60	0.20	11.1
Metals	Aluminum (Al) (mg/kg)		15200	14300	7230	7250	10300
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		<5.0	<5.0	<5.0	5.6	<5.0
	Barium (Ba) (mg/kg)		82.7	76.2	21.8	29.2	81.4
	Beryllium (Be) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)		<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)		3040	3170	1780	2120	11100
	Chromium (Cr) (mg/kg)		47.6	48.1	23.8	22.1	81.8
	Cobalt (Co) (mg/kg)		9.8	11.9	7.9	8.3	16.7
	Copper (Cu) (mg/kg)		20.1	16.9	21.3	31.4	38.2
	Iron (Fe) (mg/kg)		23200	23800	15100	15100	23600
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)		21.8	21.9	9.7	10.0	10.0
	Magnesium (Mg) (mg/kg)		8480	7980	4710	4790	7790
	Manganese (Mn) (mg/kg)		243	340	212	192	790
	Mercury (Hg) (mg/kg)		0.0094	<0.0050	0.0069	<0.0050	0.0543
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)		24.7	25.2	15.2	16.0	53.5
	Phosphorus (P) (mg/kg)		395	413	235	269	715
	Potassium (K) (mg/kg)		2950	2520	550	820	1110
	Selenium (Se) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)		480	310	<200	<200	<200
	Strontium (Sr) (mg/kg)		21.3	19.5	8.21	9.02	33.3
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)		1180	1060	509	527	351
	Uranium (U) (mg/kg)		1.37	1.32	0.297	0.370	0.378
	Vanadium (V) (mg/kg)		51.2	50.9	32.0	32.8	46.3
	Zinc (Zn) (mg/kg)		44.7	39.7	25.3	30.1	47.1

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-6	L929006-7	L929006-8	L929006-9	L929006-10
		16-AUG-10	16-AUG-10	16-AUG-10	17-AUG-10	17-AUG-10
		D20 (10-20)	D21 (0-10)	D21 (10-20)	D29 (0-10)	D29 (10-20)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	7.67	5.17	5.56	6.45	6.17
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.25	3.74	2.25	4.08	3.43
Metals	Aluminum (Al) (mg/kg)	12200	21100	19500	18600	20900
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	5.2
	Barium (Ba) (mg/kg)	39.7	112	107	100	121
	Beryllium (Be) (mg/kg)	<0.50	0.64	0.59	0.53	0.58
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	7590	3760	3630	9020	7320
	Chromium (Cr) (mg/kg)	74.5	62.8	58.6	51.8	60.6
	Cobalt (Co) (mg/kg)	17.1	11.4	10.1	10.3	12.9
	Copper (Cu) (mg/kg)	67.7	25.4	24.4	28.4	31.0
	Iron (Fe) (mg/kg)	26700	29000	27400	25500	30500
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	16.4	30.5	29.2	26.9	31.1
	Magnesium (Mg) (mg/kg)	10700	10900	10200	10000	11700
	Manganese (Mn) (mg/kg)	619	255	225	358	368
	Mercury (Hg) (mg/kg)	0.0155	0.0159	0.0100	0.0263	0.0141
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	48.3	31.1	28.6	26.2	32.5
	Phosphorus (P) (mg/kg)	321	602	552	536	516
	Potassium (K) (mg/kg)	1160	4390	3930	3330	3790
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	510	480	1030	730
	Strontium (Sr) (mg/kg)	23.4	30.0	28.0	36.4	29.8
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	746	1440	1340	1210	1400
	Uranium (U) (mg/kg)	0.774	1.63	1.62	1.03	1.47
	Vanadium (V) (mg/kg)	50.3	64.3	60.2	53.8	64.6
	Zinc (Zn) (mg/kg)	46.5	54.2	50.4	55.8	60.9

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-11	L929006-12	L929006-13	L929006-14	L929006-15
		17-AUG-10	17-AUG-10	19-AUG-10	19-AUG-10	19-AUG-10
		D32 (0-10)	D32 (10-20)	D38 (0-10)	D38 (10-20)	D43 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	5.09	5.44	5.17	5.69	7.15
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.02	1.09	0.71	0.19	4.20
Metals	Aluminum (Al) (mg/kg)	8640	8250	3380	3630	16400
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	39.7	44.0	12.8	15.4	93.0
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	0.56
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	2270	2120	984	1270	9410
	Chromium (Cr) (mg/kg)	26.2	25.7	8.2	9.6	45.7
	Cobalt (Co) (mg/kg)	6.1	5.2	2.7	3.6	9.4
	Copper (Cu) (mg/kg)	12.1	13.8	2.5	3.7	16.5
	Iron (Fe) (mg/kg)	15300	13100	7800	8610	22800
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	12.7	12.5	5.1	6.0	27.3
	Magnesium (Mg) (mg/kg)	5280	4810	2040	2320	9550
	Manganese (Mn) (mg/kg)	132	116	68.3	84.3	248
	Mercury (Hg) (mg/kg)	0.0056	0.0082	<0.0050	<0.0050	0.0175
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	14.6	14.1	<5.0	5.3	24.3
	Phosphorus (P) (mg/kg)	478	456	125	211	406
	Potassium (K) (mg/kg)	1220	1280	380	410	3960
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	240	250	<200	<200	630
	Strontium (Sr) (mg/kg)	13.0	12.5	5.88	6.67	79.9
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	584	527	335	344	996
	Uranium (U) (mg/kg)	0.748	0.735	0.249	0.332	0.837
	Vanadium (V) (mg/kg)	31.8	29.2	19.1	20.9	47.2
	Zinc (Zn) (mg/kg)	28.9	30.6	10.7	11.6	51.0

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-16	L929006-17	L929006-18	L929006-19	L929006-20
Grouping Analyte						
SOIL						
Physical Tests	pH (pH)	7.64	5.28	5.79	5.91	6.16
Organic / Inorganic Carbon	Total Organic Carbon (%)	3.21	19.3	36.4	4.77	2.40
Metals	Aluminum (Al) (mg/kg)	16000	626	2390	17400	19700
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	102	36.0	48.4	116	136
	Beryllium (Be) (mg/kg)	0.53	<0.50	<0.50	0.56	0.63
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	9000	11700	14000	4610	4580
	Chromium (Cr) (mg/kg)	43.6	<2.0	5.8	53.0	62.4
	Cobalt (Co) (mg/kg)	8.9	3.6	5.8	11.5	13.2
	Copper (Cu) (mg/kg)	21.8	5.6	9.1	23.8	26.5
	Iron (Fe) (mg/kg)	21900	4080	25200	25500	30300
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	26.2	<2.0	<2.0	26.2	31.8
	Magnesium (Mg) (mg/kg)	9200	2530	2100	10100	11500
	Manganese (Mn) (mg/kg)	246	226	112	308	337
	Mercury (Hg) (mg/kg)	0.0108	0.158	0.0695	0.0165	0.0091
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	23.5	<5.0	15.1	28.1	34.4
	Phosphorus (P) (mg/kg)	356	674	943	591	607
	Potassium (K) (mg/kg)	3140	830	<200	4370	4840
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	640	540	380	530	450
	Strontium (Sr) (mg/kg)	77.3	54.3	61.9	31.4	31.5
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	945	18.7	64.4	1200	1250
	Uranium (U) (mg/kg)	0.988	<0.050	0.219	1.88	1.97
	Vanadium (V) (mg/kg)	47.2	<2.0	9.4	57.3	64.9
	Zinc (Zn) (mg/kg)	48.6	26.5	9.0	50.9	59.1

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-21	L929006-22	L929006-23	L929006-24	L929006-25
		22-AUG-10	22-AUG-10	22-AUG-10	22-AUG-10	23-AUG-10
		D59 (0-10)	D59 (10-20)	D61 (0-10)	D61 (10-20)	D70 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.70	7.05	6.26	6.30	6.03
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.53	0.26	5.92	1.26	2.76
Metals	Aluminum (Al) (mg/kg)	5000	3680	14200	11200	3580
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	22.4	21.7	77.1	60.0	21.3
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	2470	2410	6190	4210	1800
	Chromium (Cr) (mg/kg)	17.5	13.8	41.3	34.7	9.0
	Cobalt (Co) (mg/kg)	6.2	4.9	7.2	6.6	<2.0
	Copper (Cu) (mg/kg)	22.1	16.2	13.0	12.6	5.9
	Iron (Fe) (mg/kg)	10700	8910	19700	17300	6690
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	8.6	5.7	21.8	18.3	6.4
	Magnesium (Mg) (mg/kg)	3740	2370	7990	6340	1650
	Manganese (Mn) (mg/kg)	108	83.8	240	182	41.5
	Mercury (Hg) (mg/kg)	<0.0050	<0.0050	0.0201	0.0059	0.0099
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	15.2	10.5	20.0	16.0	<5.0
	Phosphorus (P) (mg/kg)	325	363	490	579	326
	Potassium (K) (mg/kg)	540	490	2890	2640	230
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	<200	510	380	210
	Strontium (Sr) (mg/kg)	8.52	8.67	32.0	24.8	8.51
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	381	357	815	740	235
	Uranium (U) (mg/kg)	0.345	0.380	1.10	1.27	0.344
	Vanadium (V) (mg/kg)	23.7	20.9	43.3	40.3	15.1
	Zinc (Zn) (mg/kg)	18.4	15.5	57.3	33.7	9.6

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-26	L929006-27	L929006-28	L929006-29	L929006-30
		23-AUG-10	24-AUG-10	24-AUG-10	24-AUG-10	24-AUG-10
		D70 (10-20)	D72 (0-10)	D72 (10-20)	D76 (0-10)	D76 (10-20)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.15	4.53	5.09	4.96	5.67
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.68	2.59	2.54	3.27	1.64
Metals	Aluminum (Al) (mg/kg)	3810	16600	16600	16700	8450
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	20.5	73.1	81.9	102	52.6
	Beryllium (Be) (mg/kg)	<0.50	<0.50	0.51	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	1740	3280	3150	2550	2260
	Chromium (Cr) (mg/kg)	9.0	47.1	47.9	39.9	22.8
	Cobalt (Co) (mg/kg)	<2.0	6.4	6.6	8.4	5.0
	Copper (Cu) (mg/kg)	4.7	28.6	30.4	26.2	12.7
	Iron (Fe) (mg/kg)	5160	19400	19200	22900	13800
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	7.0	18.8	20.0	21.9	12.6
	Magnesium (Mg) (mg/kg)	1810	6430	6590	7200	4210
	Manganese (Mn) (mg/kg)	44.8	135	130	147	108
	Mercury (Hg) (mg/kg)	<0.0050	0.0193	0.0116	0.0206	0.0065
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	<5.0	17.4	18.0	20.8	10.9
	Phosphorus (P) (mg/kg)	386	531	473	412	405
	Potassium (K) (mg/kg)	230	1810	1680	3110	1710
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	290	250	290	220
	Strontium (Sr) (mg/kg)	7.89	27.4	23.8	21.5	15.1
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	283	1080	992	977	646
	Uranium (U) (mg/kg)	0.393	1.63	1.71	1.12	0.790
	Vanadium (V) (mg/kg)	13.3	50.6	50.3	46.0	30.1
	Zinc (Zn) (mg/kg)	8.9	34.6	35.4	46.3	22.9

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-31	L929006-32	L929006-33	L929006-34	L929006-35
		27-AUG-10	27-AUG-10	27-AUG-10	27-AUG-10	26-AUG-10
		D108 (0-10)	D108 (10-20)	D109 (0-10)	D109 (10-20)	D96 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	5.68	5.60	5.48	4.13	4.40
Organic / Inorganic Carbon	Total Organic Carbon (%)	5.64	4.31	42.1	34.1	0.50
Metals	Aluminum (Al) (mg/kg)	10200	9060	907	6910	2390
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	30.2	30.3	24.0	33.7	9.3
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	3560	4940	4630	2760	1110
	Chromium (Cr) (mg/kg)	24.3	23.7	<2.0	14.5	6.5
	Cobalt (Co) (mg/kg)	9.0	6.4	<2.0	2.3	<2.0
	Copper (Cu) (mg/kg)	20.9	23.7	4.3	4.9	1.6
	Iron (Fe) (mg/kg)	18400	17100	1200	9750	4620
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	14.6	7.0	<2.0	2.7	4.0
	Magnesium (Mg) (mg/kg)	5460	3400	1100	1390	1380
	Manganese (Mn) (mg/kg)	327	201	10.4	24.9	59.7
	Mercury (Hg) (mg/kg)	0.0504	0.0620	0.104	0.0442	<0.0050
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	15.9	12.8	<5.0	8.1	<5.0
	Phosphorus (P) (mg/kg)	425	770	530	735	193
	Potassium (K) (mg/kg)	410	370	440	590	270
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	<200	<200	<200	<200
	Strontium (Sr) (mg/kg)	16.2	19.3	29.3	23.5	5.01
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	719	454	36.4	260	165
	Uranium (U) (mg/kg)	0.428	0.798	0.062	0.609	0.219
	Vanadium (V) (mg/kg)	36.0	30.7	2.5	14.6	9.9
	Zinc (Zn) (mg/kg)	38.6	26.7	17.3	10.6	9.7

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Sample ID Description Sampled Date Sampled Time Client ID		L929006-36	L929006-37	L929006-38	L929006-39	L929006-40
		26-AUG-10	26-AUG-10	26-AUG-10	25-AUG-10	25-AUG-10
		D96 (10-20)	D99 (0-10)	D99 (10-20)	D82 (0-10)	D82 (10-20)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.35	6.53	6.40	5.90	5.95
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.20	1.45	1.49	0.76	1.61
Metals	Aluminum (Al) (mg/kg)	2300	16300	16600	3030	3480
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	9.5	104	105	17.8	23.1
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	1200	4250	4470	1620	1930
	Chromium (Cr) (mg/kg)	6.5	46.3	47.3	11.1	10.6
	Cobalt (Co) (mg/kg)	<2.0	8.8	10.2	2.2	2.6
	Copper (Cu) (mg/kg)	1.3	18.8	17.7	4.4	7.0
	Iron (Fe) (mg/kg)	4700	23100	22800	7960	8310
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	3.8	21.1	22.0	5.3	5.5
	Magnesium (Mg) (mg/kg)	1400	7720	8000	1760	1920
	Manganese (Mn) (mg/kg)	47.1	202	249	56.4	63.8
	Mercury (Hg) (mg/kg)	<0.0050	0.0079	0.0090	<0.0050	0.0071
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	<5.0	21.6	21.7	<5.0	<5.0
	Phosphorus (P) (mg/kg)	216	523	559	292	280
	Potassium (K) (mg/kg)	250	3850	3970	510	420
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	370	380	<200	<200
	Strontium (Sr) (mg/kg)	5.08	25.2	26.4	7.27	8.89
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	187	1210	1230	348	357
	Uranium (U) (mg/kg)	0.218	1.22	1.21	0.397	0.453
	Vanadium (V) (mg/kg)	10.2	53.2	54.2	19.4	20.0
	Zinc (Zn) (mg/kg)	7.3	46.2	48.4	8.8	9.8

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L929006-41	L929006-42	L929006-43	L929006-44	L929006-45
		25-AUG-10	25-AUG-10	23-AUG-10	23-AUG-10	28-AUG-10
		D88 (0-10)	D88 (10-20)	D65 (0-10)	D65 (10-20)	D119 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	5.30	5.87	5.56	4.92	5.08
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.77	0.25	0.24	3.83	0.46
Metals	Aluminum (Al) (mg/kg)	3280	2910	2650	3670	2960
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	18.3	19.1	16.6	18.1	21.3
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	1270	1310	1440	1340	1230
	Chromium (Cr) (mg/kg)	8.5	8.2	8.8	12.0	10.3
	Cobalt (Co) (mg/kg)	2.7	3.0	<2.0	2.6	<2.0
	Copper (Cu) (mg/kg)	5.7	18.4	5.2	4.8	2.3
	Iron (Fe) (mg/kg)	7500	7100	6310	7460	7600
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	6.5	4.9	4.6	5.2	4.9
	Magnesium (Mg) (mg/kg)	2000	1740	1620	2450	1960
	Manganese (Mn) (mg/kg)	59.5	62.3	48.8	57.9	54.8
	Mercury (Hg) (mg/kg)	<0.0050	<0.0050	<0.0050	0.0129	<0.0050
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	<5.0	<5.0	<5.0	5.4	<5.0
	Phosphorus (P) (mg/kg)	203	259	360	267	214
	Potassium (K) (mg/kg)	520	470	420	530	700
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	<200	<200	<200	<200
	Strontium (Sr) (mg/kg)	6.86	6.12	6.58	8.22	6.74
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	357	279	231	377	407
	Uranium (U) (mg/kg)	0.392	0.324	0.422	0.344	0.281
	Vanadium (V) (mg/kg)	16.4	14.9	14.3	17.5	19.8
	Zinc (Zn) (mg/kg)	9.9	8.3	7.8	11.2	9.9

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L929006-46	L929006-47	L929006-48	L929006-49	L929006-50
		28-AUG-10	28-AUG-10	28-AUG-10	29-AUG-10	29-AUG-10
		D119 (10-20)	D122 (0-10)	D122 (10-20)	D132 (0-10)	D132 (10-20)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	5.50	5.02	5.94	5.09	6.17
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.49	2.42	2.71	1.67	0.43
Metals	Aluminum (Al) (mg/kg)	3480	6280	8800	3470	2850
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	28.0	35.0	46.1	21.4	15.1
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	1350	2070	2550	1710	1340
	Chromium (Cr) (mg/kg)	13.1	18.6	24.9	10.5	9.2
	Cobalt (Co) (mg/kg)	2.5	3.2	3.7	3.4	2.4
	Copper (Cu) (mg/kg)	5.7	6.9	8.8	9.1	7.1
	Iron (Fe) (mg/kg)	7890	9940	13000	7340	6590
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	6.7	10.2	12.2	6.4	4.8
	Magnesium (Mg) (mg/kg)	2270	3070	3910	1910	1590
	Manganese (Mn) (mg/kg)	60.6	70.9	92.0	64.8	51.1
	Mercury (Hg) (mg/kg)	<0.0050	0.0099	0.0160	0.0117	<0.0050
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	5.0	8.3	10.9	5.6	<5.0
	Phosphorus (P) (mg/kg)	243	489	582	295	269
	Potassium (K) (mg/kg)	750	890	1130	480	360
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	240	<200	240	<200	<200
	Strontium (Sr) (mg/kg)	7.77	14.7	19.3	7.84	5.50
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	403	415	514	280	240
	Uranium (U) (mg/kg)	0.412	0.807	0.923	0.482	0.319
	Vanadium (V) (mg/kg)	20.7	21.7	27.3	16.7	15.3
	Zinc (Zn) (mg/kg)	12.2	23.3	33.4	9.6	7.7

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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C-TOT-ORG-LECO-SK Soil Organic Carbon by combustion method SSSA (1996) p. 973
 Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:

Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

HG-CCME-CVAFS-VA Soil CVAFS Hg in Soil (CCME) BCMELP CSR SALM METHOD 8/EPA 245.7

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-200.2-CCMS-VA Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

PH-1:2-VA Soil CSR pH by 1:2 Water Leach BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

SK ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample.

mg/kg ww milligrams per kilogram based on wet weight of sample.

mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



RESCAN ENVIRONMENTAL SERVICES
ATTN: BEN SEY
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3
Phone: 604-689-9460

Date Received: 20-SEP-10
Report Date: 05-OCT-10 13:19 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L933907
Project P.O. #: NOT SUBMITTED
Job Reference: 1009-002-13 HOPE BAY PROJECT 2010
Legal Site Desc: HOPE BAY PROJECT
C of C Numbers:

Dean Watt
Account Manager

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ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L933907-1	L933907-2	L933907-3	L933907-4	L933907-5
		12-JUL-10	12-JUL-10	14-JUL-10	14-JUL-10	15-JUL-10
		8 (0-10)	8 (10-20)	13 (0-10)	13 (10-20)	14 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.03	6.22	5.70	6.05	6.63
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.07	3.85	0.22	<0.10	1.10
Metals	Aluminum (Al) (mg/kg)	17300	19100	2700	3350	18700
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	93.2	106	15.3	22.6	117
	Beryllium (Be) (mg/kg)	<0.50	0.52	<0.50	<0.50	0.59
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	4100	5130	1210	1850	4620
	Chromium (Cr) (mg/kg)	52.2	56.8	9.4	10.5	58.8
	Cobalt (Co) (mg/kg)	10.4	11.9	<2.0	3.1	13.8
	Copper (Cu) (mg/kg)	13.8	17.0	4.7	7.8	19.1
	Iron (Fe) (mg/kg)	26300	29100	7130	7950	29700
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	26.8	29.4	5.9	6.5	33.3
	Magnesium (Mg) (mg/kg)	10200	11400	1760	2250	11300
	Manganese (Mn) (mg/kg)	286	362	47.7	67.2	330
	Mercury (Hg) (mg/kg)	0.0107	0.0205	<0.0050	<0.0050	0.0079
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	23.3	27.3	<5.0	5.3	29.8
	Phosphorus (P) (mg/kg)	402	512	310	393	584
	Potassium (K) (mg/kg)	3890	4380	510	760	4400
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	520	510	<200	<200	460
	Strontium (Sr) (mg/kg)	23.2	29.5	5.22	7.10	24.7
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	1220	1330	255	325	1230
	Uranium (U) (mg/kg)	1.06	1.26	0.396	0.547	1.75
	Vanadium (V) (mg/kg)	58.0	63.5	16.7	17.6	64.6
	Zinc (Zn) (mg/kg)	47.4	54.8	8.4	10.4	51.3

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L933907-6	L933907-7	L933907-8	L933907-9	L933907-10
		15-JUL-10	15-JUL-10	15-JUL-10	16-JUL-10	16-JUL-10
		14 (10-20)	18 (0-10)	18 (10-20)	21 (0-10)	21 (10-20)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.32	6.27	6.42	6.46	6.42
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.47	0.97	0.85	1.52	2.92
Metals	Aluminum (Al) (mg/kg)	19200	9170	10900	22500	23200
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	112	46.3	53.5	127	135
	Beryllium (Be) (mg/kg)	0.59	<0.50	<0.50	0.61	0.63
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	4860	2560	3180	5470	5650
	Chromium (Cr) (mg/kg)	60.9	29.2	33.1	65.3	65.8
	Cobalt (Co) (mg/kg)	13.5	5.4	5.9	13.6	14.4
	Copper (Cu) (mg/kg)	17.8	10.5	12.4	24.8	27.7
	Iron (Fe) (mg/kg)	30600	14600	16200	33100	33800
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	31.6	14.9	18.2	34.6	37.3
	Magnesium (Mg) (mg/kg)	11300	5870	6740	13700	14200
	Manganese (Mn) (mg/kg)	324	122	138	345	413
	Mercury (Hg) (mg/kg)	0.0069	<0.0050	<0.0050	0.0078	0.0099
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	29.4	14.8	17.3	32.3	34.7
	Phosphorus (P) (mg/kg)	600	448	529	446	531
	Potassium (K) (mg/kg)	4500	2140	2660	5480	6020
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	490	310	410	710	680
	Strontium (Sr) (mg/kg)	27.1	15.3	20.4	30.2	33.3
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	1330	660	757	1540	1490
	Uranium (U) (mg/kg)	1.64	0.841	0.961	1.57	1.59
	Vanadium (V) (mg/kg)	66.6	32.9	37.2	72.7	72.0
	Zinc (Zn) (mg/kg)	52.0	23.8	29.0	57.1	61.2

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L933907-11	L933907-12	L933907-13	L933907-14	L933907-15
		16-JUL-10	16-JUL-10	16-JUL-10	16-JUL-10	18-JUL-10
		22 (0-10)	22 (10-20)	23 (0-10)	23 (10-20)	29 (0-10)
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.46	7.52	6.00	6.15	5.62
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.98	0.17	1.78	2.61	5.89
Metals	Aluminum (Al) (mg/kg)	8630	12800	21900	22500	12500
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)	33.6	69.4	134	131	71.0
	Beryllium (Be) (mg/kg)	<0.50	<0.50	0.66	0.65	<0.50
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	3100	3940	4320	5040	4000
	Chromium (Cr) (mg/kg)	34.5	42.7	65.6	67.2	35.8
	Cobalt (Co) (mg/kg)	9.2	11.3	12.9	14.7	8.7
	Copper (Cu) (mg/kg)	22.6	35.1	26.2	25.6	15.3
	Iron (Fe) (mg/kg)	16800	22300	30900	32700	19900
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	11.5	19.0	35.6	34.4	19.0
	Magnesium (Mg) (mg/kg)	6540	9770	13000	13200	8750
	Manganese (Mn) (mg/kg)	278	301	294	360	230
	Mercury (Hg) (mg/kg)	0.0067	<0.0050	0.0101	0.0106	0.0273
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	23.2	30.2	35.0	35.7	19.7
	Phosphorus (P) (mg/kg)	284	442	490	578	385
	Potassium (K) (mg/kg)	1040	2630	4770	4710	3580
	Selenium (Se) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	240	510	510	520	530
	Strontium (Sr) (mg/kg)	11.1	17.3	26.8	29.1	24.2
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	523	744	1470	1510	928
	Uranium (U) (mg/kg)	0.342	0.416	2.23	2.05	1.35
	Vanadium (V) (mg/kg)	35.2	46.0	71.7	73.3	43.6
	Zinc (Zn) (mg/kg)	22.8	37.9	59.0	61.0	36.8

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L933907-16	L933907-17	L933907-18	L933907-19	L933907-20
		Description					
		Sampled Date	18-JUL-10				
		Sampled Time					
		Client ID	29 (10-20)	11 (0-10)	11 (10-20)	16 (0-10)	16 (10-20)
Grouping	Analyte						
SOIL							
Physical Tests	pH (pH)		6.14	6.24	7.28	6.59	7.05
Organic / Inorganic Carbon	Total Organic Carbon (%)		3.34	1.20	0.10	1.22	7.32
Metals	Aluminum (Al) (mg/kg)		21300	3450	9250	2190	13600
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (Ba) (mg/kg)		128	19.2	60.5	13.8	109
	Beryllium (Be) (mg/kg)		0.56	<0.50	<0.50	<0.50	<0.50
	Bismuth (Bi) (mg/kg)		<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)		5910	1070	3580	1240	13800
	Chromium (Cr) (mg/kg)		59.4	8.5	30.5	7.6	41.8
	Cobalt (Co) (mg/kg)		13.7	2.2	8.3	2.0	9.3
	Copper (Cu) (mg/kg)		27.6	6.2	19.4	5.7	40.3
	Iron (Fe) (mg/kg)		32000	7470	16200	6020	20400
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)		33.9	9.1	16.9	4.4	24.0
	Magnesium (Mg) (mg/kg)		13900	1910	6360	1390	8730
	Manganese (Mn) (mg/kg)		369	48.2	211	39.7	234
	Mercury (Hg) (mg/kg)		0.0084	0.0064	<0.0050	<0.0050	0.0239
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)		32.0	<5.0	18.9	<5.0	28.5
	Phosphorus (P) (mg/kg)		538	177	303	288	521
	Potassium (K) (mg/kg)		5200	480	1910	370	2860
	Selenium (Se) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)		840	<200	320	<200	550
	Strontium (Sr) (mg/kg)		35.3	6.93	13.7	4.56	30.9
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)		1470	309	665	176	746
	Uranium (U) (mg/kg)		1.94	0.379	1.06	0.345	1.30
	Vanadium (V) (mg/kg)		69.9	16.8	35.6	14.0	41.3
	Zinc (Zn) (mg/kg)		59.4	10.5	25.1	6.9	36.4

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SR:COC	Sample Received, Not Listed on Submitted Chain of Custody / Analytical Request Form - samples # 11 (0-10), 11 (10-20), 16 (0-10), 16 (10-20) - extra not on CoC

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)	SSSA (1996) p. 973

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:

Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7
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This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A
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This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
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This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA
SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg milligrams per kilogram based on dry weight of sample.

mg/kg ww milligrams per kilogram based on wet weight of sample.

mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L milligrams per litre.

< - Less than.

D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.